

AMERICAN VETERINARY REVIEW.

JANUARY, 1912.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, November 15, 1911.

ANAPHYLAXY AND PARTURIENT FEVER.—In three numbers of the *Annales de Belgique* of the beginning of the year, Mr. Ch. Van Goidsenhoven, Adjunct Professor to the Veterinary School of Bruxelles, has considered the relations that may exist between these two morbid manifestations, which are here condensed.

At first he concisely passed a review of the various theories advanced to explain the etiology of vitulary fever, and then considers that the theory of intoxication is the one which seems to be most generally admitted. Although it fails in explaining the real cause of the disease, and Schmidt's treatment itself, with its so precious applications, has not thrown any light on this pathogenic problem.

Following this the author considers the theory of anaphylaxy and shows its advantages. First he shows that bovines may become anaphylactic, as proved by Alexandresco and A. Cirrca in their application of anti-anthrax sero-vaccination. He inquires, in the production of vitulary fever, what may be the anaphylactogenous element.

If parturient fever is certainly related to parturition it cannot be in an inseparable manner, taking into consideration the cases which are observed unconnected with parturition. It is not the same as far as lactation, which remains the condition *sine qua non* of the production of the disease, and is never observed outside the period of activity of the mammae.

Normal milk contains a compound which is possessed of anaphylactogenous properties, a power which has so far been only granted to albumines. Of the three albumines that milk contains, caseine alone differs from the circulating albumine. It then acts, towards the individual from which it comes, as a foreign albumine and consequently may have anaphylactogenous properties.

Sensibilization takes place during lactation and consists in the resorption of a certain quantity of milk through the udder. In his researches upon lactosuria, Mr. Porcher has shown that it was only necessary to disturb slightly the elimination of milk in females during the period of activity of the udder to see lactose appear in the urine. Mr. Van Goidsenhoven, by his personal experiments and those of Michoelis and Roma, shows that caseine also is resorbed during lactation and thus sensitization is realized. This autosensibilization will be so much more efficacious that it takes place in a better milker, able to resorb a greater amount of milk by the udder. To sustain this theory he relates the fact that frequently three weeks or one month before parturition, artificial drying of cows is resorted to with animals in which a good secretion of the gland for the following parturition is to be preserved. This drying is one of the best means to realize the mammary resorption.

How does the reinjection occur? Porcher and Leblanc have shown that pregnant females some days before parturition manifest a state of lactosuria which reaches its maximum the day of delivery. This lactosuria necessitates through the udder at that same time, the resorption of a certain quantity of milk sugar. Mr. Von Goidsenhoven thinks that the caseine must be likewise resorbed, but that if it does not appear in the urine, it

is because it unites with the antibodies produced by the caseine, resorbed when the sensitization occurs. The autosensibilization is thus followed by an auto-reinjection. But the resorption related to parturition gains only the value of an auto-reinjection when it involves a sufficiently large quantity of milk, as the reinjection requires doses a thousand times greater than sensitization does. That is why only good milkers are susceptible to contract parturient fever.

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Is there a preanaphylactic stage? Vitular fever affects in preference good milking cows whose secretion stops a certain time before calving. Between the first resorption of milk-producing sensitization and the second resorption preceding the reinjection, there is a lapse of time passing of some three weeks which is really a true preanaphylactic stage. By the sensitization there develops in the organism a specific antibody, which at the time of the reinjection unites with the new quantity of caseine introduced. This union allows the alexine to attack the caseine and gives rise to products of toxic disintegration. The theory of anaphylaxy is, then, related to that of intoxication and precisely its mechanism.

The author shows then that the theory of anaphylaxy explains why cases of vitular fever are rarely observed in primiparas, while it allows an interpretation of those which occur, and again it explains the cases observed before parturition or beyond this under the influence of rich or of heavy feeding.

The symptoms of parturient apoplexy resemble those of anaphylaxy. They indicate an alteration of the nervous centres, began by a state of more or less marked excitement, followed by one of lasting and severe depression.

The lesions in both diseases are insignificant (congestion, haemorrhages, infiltrations of some organs, repletion of abdominal visceral blood vessels).

The efficacy of the injection of air in the udder as in the treatment of Schmidt is explained by two factors: (1) the quan-

tiny of air introduced compresses the mammary cells and arrests the resorption of caseine; (2) it raises the arterial tension by controlling the vasomotor troubles, which are the most alarming expressions of this syndrome.

Mr. Van Goidsenhoven then shows that the prophylactic means used up to this day may find the explanation of their action in the theory of anaphylaxy and principally venesection a few days before delivery as removing from the body a certain quantity of the anaphylactic antibody collected in the blood.

Every time hypersensibility by caseine will be suspected in a milch cow advanced in pregnancy it will be indicated to make repeated small subcutaneous injections of milk before the calving. A mode of prophylaxy upon which experience alone will decide.

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ENTRANCE OF AIR IN VEINS.—Resuming in the *Revue Générale* the work of Prof. Richter, of Dresden, after giving a historical sketch of the question, a concise review of the experiments that were made by many pathologists, physiologists and practitioners, with also a consideration of the symptoms and various theories advanced, the principal conclusions of the studies carried out by Prof. Richter in the *Archiv für Wissenschaftliche und praktische Tierheilkunde* are resumed as follows:

1. It is demonstrated that death can follow the artificial introduction of air in the veins of animals.
2. There are numerous observations published showing that serious accidents and death are due to the accidental entrance of air in an open vein.
3. Spontaneous entrance of air takes place, almost without exception, where there exists in the veins a negative pressure.
4. In most cases, accidents due to an aerial embolus are pathognomonic.
5. A gurgling noise is heard first, due to the entrance of the air, and then a cardiac sound.
6. The systolic cardiac sound is stronger than the diastolic, and this last is more appreciable in horses.

7. The cardiac murmur becomes weaker and disappears after twenty minutes at the latest.
8. In some cases there is noticed in horses an increase in the zone of the cardiac dullness.
9. The pulse presents qualitative and quantitative alterations.
10. Dyspnœa is consecutive to the cerebral anæmia.
11. Muscular twitchings begin in the muscles of the chest and afterwards extend to those of the extremities.
12. In horses, perspiration begins at the shoulder, then to the neck, round the anus and sexual organs, internal face of the thighs and the croup.
13. The evolution of the attack is acute and death takes place rather in the first half hour; in very acute cases, due to the introduction of great quantity of air, death occurs after ten minutes at the most.
14. In this case a favorable change is possible.
15. Thermic fluctuations up to one degree may be produced by intravenous injections of air.
16. Half of the dogs stand without difficulty the injections of 20 c.c., but that is a "dangerous limit."
17. The danger increases with the greater quantity of air.
18. Quarter of a litre of air introduced kills dogs certainly.
19. Horses may receive 1000 c.c. with impunity.
20. Eight litres is the lethal dose of horses.
21. The cause of death is embolus of the pulmonary artery; there is cerebral anæmia and death by asphyxia.
22. The theory of "death by the heart" is to be abandoned, as the organ beats still after death. In rabbits the right auricle contracts seven hours after death.
23. The air contained in the heart excites the contractions.
24. In rabbits and dogs, the air reaches only in very small quantities the left heart, through the pulmonary capillaries; on the contrary, in horses, it enters in large quantity.
25. The possibility of an embolus of the arteries of the brain or of the heart, by the emulsion of the blood, is admissible; but this form of death by the brain or by the heart is very rare.

26. Clinical and anatomical observations speak against the theory of death by the brain.
27. Lungs are the natural protectors of the organism against the danger of the introduction of air.
28. Prophylaxy is very important, as little can be expected of the treatment against the gaseous embolus.

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PERISTALTIC HORMON.—The generic name of *hormons* has been given by Starling to chemical bodies which take their origin in the cells of certain organs and which, transported some distance by the circulation, go to produce an effect of activation upon other organs; which takes place without the interference of the nervous system.

Peristaltic hormon has been discovered in 1908 by Zuelzer, Dohrn and Marzer. They observed that extracts prepared with the mucous membranes of the stomach and of the superior portion of the duodenum, taken at the time of full digestive activity, would give rise to energetic peristaltic contractions of the intestines, when they were injected in the blood circulation. They, besides, observed also that this same peristaltic hormon is found in great quantity in the spleen. They admit then that this substance is elaborated in the cells of the gastro-duodenal mucous membrane and is stored up in the spleen. This is merely a supposition. But what is a fact is that the extracts of the gastric mucus and of the spleen have a truly specific action upon the contractibility of the intestine. Practically, it is with the spleen that it is easiest to prepare aseptically this active substance, which is sold under the name of *hormonal*.

The *physiological effects* are very positive. In man, the effect upon the peristaltism began to appear between fifteen and thirty minutes after the intravenous injection or between two and four hours after the intramuscular injection. The manifestations noticed on laboratory animals are more positive, as they show that really the action of *hormonal* is almost instantaneous and

that strong intestinal contractions take place a few seconds after the injection being thrown in a vein.

The contractions promoted by hormonal are *true peristaltic waves, beginning at the duodenum and gradually progressing to the rectum*, and resulting in the expulsion of gases and feces. There is then an absolute opposition with the results obtained by the injection of physostigmine, which produces a localized, fixed and lasting contraction, a true tetanization of the segment of the intestine and which consequently is without beneficial effect, upon the progression of the intestinal contents.

This hormonal, which shows itself so specifically active, has been tried clinically in two orders of very distinct affections, in chronic constipation and in acute paralysis of the intestines.

The technic of the injections is very simple. Hormonal is sold in vials of 20 cubic centimetres, which represent the normal dose for a human patient. This dose can be increased without inconvenience, when the normal has proved insufficient or when the case is pressing; 30 and 40 cubic centimetres are frequently used by Zuelzer. The injection can be renewed at short intervals —no phenomena of anaphylaxy have ever been observed. The injection can be made in the gluteal region or in a superficial vein. This last is more rapid in its effects and less painful.

The accidents are of very little importance. Sometimes a little febrile reaction takes place. It soon falls off.

The only real, serious objection to the use of hormonal is that if it has in the majority of cases a peristaltic influence, most marked, and most energetic, there are a certain number of individuals which are entirely refractory to it. This peculiarity has also been observed in animals of experiment as well as in man. But as its use is harmless and without danger, it can be resorted to in all intestinal paralyses which are rebellious to ordinary means.

These remarks, which I have taken from the *Presse Medicale*, will be of interest to veterinarians. If the effects of hormonal can be manifested in our large animals as rapidly as they do in

the human, it is certain that the life of many valuable horses subject to chronic constipation may be saved. Hormonal will certainly then become *the* mode of treatment of those difficulties. The subject may not be exactly to the point yet, but it certainly deserves notice and calls for experimentation at the hands of our practitioners.

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PELVIC ANGUSTY AND DISTOKIA IN BOVINES.—In the *Annales de Bruxelles* there have appeared, in a series of numbers, articles from the pen of Mr. E. Deghilage, entitled "*Congenital narrowness of the anterior pelvic strait, considered as a cause of distokia and its relations with the external conformation in bovines.*"

One of the most frequent causes of distokia is the narrowness of the pelvis. This pelvic angusty is very seldom due to the causes named by writers; fractures, rachitic deformities, tumors, etc. In most cases, and particularly in improved breeds, this cause is due to a congenital malformation of the anterior strait, which is so much more common that breeders prefer more and more animals affected with this anomaly and keep them for breeding.

From numerous observations Deghilage is brought to the conclusion that this conformation is due to a rotatory motion of the ossæ innominata round a point situated below the coxo-femoral joint. This motion takes place in such a manner that both pubis are squeezed against each other and there results a raising of the anterior part of the pelvic floor, which one will detect by vaginal examination; at the same time the two ischioms spread apart and more or less enlarge the ischial arch. Besides this, the external angle of the ilium is drawn downwards and often forwards, while the internal rises and deviates apart from that of the opposite side. One can readily understand that these rotatory and twisting motions, combined, will have for result the widening of the posterior straight with the narrowing of the anterior. From which results a double inconvenience: first, the

foetus passes with difficulty the anterior strait thus contracted, especially if it has inherited the maternal conformation, as is often the case; and second, the abnormal width of the posterior strait may be the cause of laceration of the vaginal and vulval walls at the time of parturition, as they are then no longer supported by the bony surroundings.

This modification of the pelvis has for result a special conformation of the croup which is known as *giantism of the hind quarter*, which may vary according to the motion of displacement executed by the ossæ innominata.

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If the displacement has been in a transversal direction, one will observe the flatness of the hips, the division of the croup by a groove sometimes very apparent in front, and the exaggerated separation between the ischial tuberosities. In its whole appearance, the croup has a trapezoid shape, with its posterior base wide, and at the same time the gluteal region seems to have lost its muscle and the rump has grown bigger.

If, on the contrary, the rotatory motion has taken place in the longitudinal direction, the croup is long, horizontal, and resembles somewhat that of a thoroughbred horse.

Finally, and that is the most frequent in females kept for breeding, there may be a combination of both motions; it is then the *mixed giantism*. The croup then resembles that of a heavy draught horse, the tail is attached high, and the croup is incurved backwards. Females which have this conformation have thick skin, hair long and coarse, small udder, and the yellowish coloration of the skin, characteristic of good milkers, is not present. Heredity is the most important factor in this anomaly.

The intervention of the veterinarian in cases of distokia due to this will consist in trying to draw alternatively the two shoulders and then the two coxo-femoral joints. If unsuccessful, he will perform embryotomy. But the serious nature of this inter-

ference shows how important it is to reject for breeding purposes all females having such conformation.

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ROARING AND ITS SURGICAL TREATMENT.—The *Veterinary Journal* for October brings out two papers which were read before the AMERICAN VETERINARY MEDICAL ASSOCIATION at the Toronto meeting. One by Prof. Williams on his operation, and the other by Prof. Hobday on the same subject. Both of these are already familiar to our readers; they have heard them in Toronto.

But in the same number of our contemporary there is also an article from Prof. J. J. O'Connor, M.R.C.V.S., which is very interesting, as it gives the record of ten cases of roarers which were treated by excision of the laryngeal ventricle, with the results following the operation. With No. 1 carrying a tracheotomy tube at the time of the operation, the left arytenoid was seen completely paralyzed. The left ventricle was only stripped. *Results:* Stenosis of the trachea occurred when tracheotomy had been performed, causing dyspnoea, and the horse was destroyed. No. 2, a complete success. No. 3, successful. No. 4, not improved two months after the operation. No. 5, became incurably lame and not tried. No. 6, operated on both ventricles; not improved after two months. No. 7, reported making still a hissing noise but not the sharp whistling of before the operation. No. 8, most successful. No. 9, five months after the operation, is no better. No. 10, both ventricles removed, not yet tried.

From the results thus obtained, Prof. J. J. O'Connor says that the conclusion he has come to is "that when the arytenoid is undoubtedly paralyzed, the operation is likely to be successful, but if the cartilage is not, a successful result need not be expected. It is evident that many horses make a noise from other causes than paralysis of the arytenoid cartilage, and the noise is called roaring or whistling for the want of a better name. Up to the present I am sure many such cases have been operated

upon as roarers or whistlers, and have been numbered as examples of failures of the operation. The reputation of the operation is being damaged in this way."

These are very valuable suggestions which cannot be ignored, and no doubt that those who have performed a great number of operations and made minute observations can throw a great deal of light on the prognosis of this important surgical interference.

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606 AND GLANDERS IN LABORATORY ANIMALS.—Salvarsan has made its way in human pathology; it was but natural that its effects on animals should also call the attention of scientists. Prof. Mag. W. Benwolensky has published in a Russian journal his experiments on the effect of 606 upon the evolution of glanders in animals of the laboratory, which were recorded in the *Zeitschrift f. Wiss. und prakt. Veterinarmedizin*.

After considering concisely the importance of antisepsy in the struggle against infectious diseases, the author passes a review of the pharmaceutical products used against glanders. He then glances to the basis of the therapy with 606, or Salvarsan, treats of its literature, composition, mode of use, toxicology and doses.

In a second part of his work he makes known his own researches and described (1) the technic used in his experiments; (2) those very experiments, and presents his conclusions. Fifty-two animals were used—guinea pigs, rabbits and cats. The author has also searched what were the effects of the Salvarsan upon experimental glanderous process and its action upon the bacilli of glanders *in vitro*.

Prof. Benwolensky's conclusions are:

1. Injected into glanderous animals, the 606 has an influence on the progress of the disease.
2. This influence appears in a manifest manner, when one takes in consideration that glanderous animals succumb rapidly to acute glanders when they receive the injection of a dose,

nearly as the one which is supported, and that they survive after smaller doses.

3. In case of acute glanders, it is possible to sterilize the infected organism; as proved by the fact that cultures in media with blood of animals dead in those conditions remain negative.

4. It is probable that the destruction of glandorous bacilli in the organism takes place through two factors: (a) the chemical action of the Salvarsan; (b) the action of the antibodies which were formed under its influence.

5. From the results obtained, it is necessary to resort to small doses of the 606 to destroy the bacilli. This fact was observed by experiments *in vitro*. Solution of 1 in 40,000 kills the bacilli in one minute; solution of 1 in 100,000 kills them in three minutes; solution of 1 in 1,000,000 kills them in fifteen.

6. Strong doses of 606 kill a very great quantity of bacilli; but the products of the destruction give rise to rapid death of the experiment animals.

7. The best form of administration is in alkaline solution.

8. The product is best kept in liquid paraffin.

9. The best manner to administer 606 is by intravenous injection.

10. The maximum dose for intravenous injection is of 0.1 by kilogram of the weight of the animal for rabbits and 0.015 for cat. It is of 0.016 for subcutaneous injections in guinea pigs.

11. Besides its scientific interest, the product of Ehrlich has also a great practical value.

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VETERINARY DIRECTOR HONORED.—The *Société Centrale de Medecine Veterinairé* of Paris, at the last sitting of November, 1911, has elected by a unanimous vote Dr. Veranus A. Moore, the Director of the New York State Veterinary College, as foreign corresponding member. The Veterinary Academy of France has done well in this selection of a gentleman who, by his numerous and scientific works on veterinary subjects, has

helped so much to the progress of comparative and veterinary medicine. Our confrères in America will appreciate the deserved compliment paid to Dr. Moore.

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BIBLIOGRAPHIC ITEMS.—From the Bureau of Animal Industry I have received three bulletins:

Bulletin 136—On the "*Diagnosis of Glanders by Complement Fixation*," by John R. Mohler, V.M.D., and Adolph Eichhorn. Dr. S.— I have already alluded to it in July last.

Bulletin 129—On "*Cattle Breeders' Associations in Denmark*," by Prof. T. Masmussen.

Bulletin 125—On "*A Comparative Study of Methods of Examining Feces for Evidences of Parasitisms*," by Maurice C. Hall, of the Zoological Division. In March last I called the attention of the readers of the REVIEW to Copzology, in a general way. The bulletin of Dr. M. C. Hall is treating of a special application of this means of diagnosis. The examination of feces for the presence or absence of parasites infesting the alimentary canal, cannot be ignored by practitioners, to whom it must be as interesting as it would to ordinary investigators. The methods to carry out the examination are quite numerous and considered by Dr. Hall. He also gives one of his own and makes a comparison of the results which he has obtained with it, and others, such as the smear, the sedimentation, the burette, the filter, etc.

Valuable practical information can be obtained by the reading of Bulletin 125.

A. L.

OUR ARMY VETERINARY SERVICE BILL.

In our "Army Veterinary Department" of this issue, on page 521, will be found much of interest not only to veterinarians in the army veterinary service, but to *all* veterinarians in America. First will be found an interesting account of the drawing up

of the present Bill, by Olaf Schwarzkopf, Veterinarian, Third Cavalry, U. S. Army. This is followed by a copy of the Bill; after which we have published a "Brief" showing the necessity of the enactment of the proposed Bill; and that is followed by the facts as related to the army veterinary service, set forth in Dr. N. S. Mayo's report on our Insular Possessions to the A. V. M. A. convention at Toronto, which we purposely held for use in connection with this Bill. For, while many veterinarians may be provided with copies of the Bill, still (as expressed by Dr. Schwarzkopf in his letter of transmittal), "by publishing it in the AMERICAN VETERINARY REVIEW, *all* veterinarians will have it." Not only that, but by giving the space that we have given to the publication of the Bill, Brief, and other matter consecutively, we have furnished veterinarians with a lot of instructive reading that they can carry conveniently about with them until they have familiarized themselves with the *whole subject* and will be in a position to show their Congressmen good reasons why this Army Veterinary Bill should become a law. Familiarization with the whole subject, gained by a careful perusal of the Brief, will do more besides loading veterinarians up with good argument for their Congressmen: it will load them up with enthusiasm—enthusiasm that only comes with a *realization of the present status of army veterinarians in the United States, how their status compares with that of other countries, and the elevating influence upon the veterinary profession in our own country, that would result from the proper recognition of the veterinarian in the United States Army.* An influence that is more powerful and far-reaching than occurs to many of us until we stop to give the matter a little time for thought from our busy lives. And we believe our "Army Veterinary Department" of the present issue will have the effect of *arresting* the attention of the American veterinary profession and concentrating its thoughts upon the subjects which that department has dealt with. The elevation of the veterinary profession forms an important part of the life-work of all of its worthy members; and nothing will expedite that work more than that of obtaining

the proper recognition of the veterinarian in the army. Concentrate all your efforts there and you will benefit your country, your brothers in the army veterinary service and the veterinary profession at large. Drs. D. Arthur Hughes and Walter G. Hollingworth, of the Committee on Army Legislation of the American Veterinary Medical Association, spoke enthusiastically and encouragingly of the prospects of accomplishing army veterinary legislation in the present Congress, at the Illinois Veterinary Medical Association in Chicago last month and stated that the committee was already actively at work preparing for the "charge." Let it be strong and unrelenting when it is made, and success is assured.

AN EDUCATIONAL WEEK IN CHICAGO.

The week beginning December 4 was one filled with educational feasts at Chicago, for those in search of knowledge along the lines of sanitary science and the live-stock industry. For what with the Live-Stock Show (which, by the way, opened on the Saturday previous up at the stock yards), the United States Live Stock Sanitary Association, which opened at the Hotel Sherman on Tuesday the 5th, and the Illinois State Veterinary Medical Association, which opened at the Lexington Hotel on the 7th, it was a pretty full week.

The United States Live Stock Sanitary Association held one of the most successful and valuable meetings in its history, and increased its membership more than 100 per cent., having 66 when it convened and 151 when it adjourned, an addition of 85 new members; and its enterprising secretary, Prof. J. J. Ferguson, sees no reason why it should not have a membership of 500, which it no doubt will have at some time. The president of the association, Dr. John F. De Vine, sounded the gavel promptly at 9.30 a. m. of the 5th and introduced the Corporation Counsel of the City of Chicago, who welcomed the association to the city, which was responded to by Dr. M. P. Ravenel, of Wisconsin. President De Vine, realizing the extent of the pro-

gram before him, disposed of all business matters and committee reports with his characteristic expedition, and plunged immediately into the reading of papers. Dr. W. F. Crew, of Devil's Lake, N. D., read on "The Proper Organization of a State Live Stock Sanitary Commission"; Dr. J. I. Gibson on "The Province of the State Veterinarian in Sanitary Control Work." The relative merit of these plans was then discussed by Dr. D. F. Luckey, of Columbia, Mo.; Dr. P. F. Bahnsen, of Americus, Ga.; then discussed "Co-operation Between Federal and State Authorities in Control Work." These discussions were very instructive and interesting, coming as they did, extemporaneously, from two men thoroughly familiar with the questions at issue. Two papers on "Methods of Popular Education in an Anti-Tuberculosis Campaign" were then presented by Mr. A. G. Glover, Editor of *Hoard's Dairyman*, Fort Atkinson, Wis., and Dr. Robert W. Ellis, Editor of the *AMERICAN VETERINARY REVIEW*, New York. Dr. K. F. Meyer, director of the Pennsylvania Live Stock Sanitary Laboratory, Philadelphia, presented an ably prepared paper on "The Newer Methods of Tuberculin Testing," and Dr. V. A. Moore, Director of the New York State Veterinary College, Ithaca, on "Bovine Tuberculosis, Its Problems and Control." The discussion of the subjects covered by these papers was opened by Dr. M. P. Ravenel, Wis.; the discussion covering location, prevention, eradication and popular education. Dr. A. T. Kinsley followed in the discussion, expressing it as his opinion that different methods of control must of necessity be applied in different states. Speaking of the application of the Bang system, the doctor believes that tubercle bacilli are kept on the premises in the manure, which is afterward spread on the land and carried beyond the domain of the segregated cattle by birds chickens, etc., to other parts of the farm and to other farm animals, as hogs, etc. He believes in pasteurization of milk. The chair added to the discussion that, in his own state (New York), at the Wood Crest farm, where the Bang system was employed in a herd of 168 head, in which 60 per cent. of the cattle were found to be tuberculous at the beginning, that only one reactor

was found at the last test made, in a period of time covering less than three years.

Dr. J. G. Wills, of the New York State Department of Agriculture, stated that in about 600 cattle held under the Bang system by the state, 29 calves obtained from 40 reactors showed no reaction. Being questioned as to the age at which he tested the calves, he stated that he does not recommend testing them under six months of age. Milk from reactors in which no physical evidence of the disease can be detected, after having been heated to 185° F., may be fed to the calves, or (if we understood him correctly) sold under the law. Dr. J. I. Gibson, State Veterinarian of Iowa, who had asked the question as to the age at which the calves were tested, stated that while you get practically no reaction in yearlings under the Bang system, the same young stock tested at two years of age will give about the same percentage of reactors as their mothers. Dr. Cotton, of Minneapolis, expressed his belief in the application of the Bang system, stating that in herds where 95 per cent. reacted to the tuberculin test, at the beginning, only two calves reacted at the end of seven years. The calves in his experiments were allowed to suck the mother once, and thereafter were fed on Pasteurized milk. Dr. M. H. Reynolds, of Minnesota, expressed the opinion that the Bang system was impracticable except in pure-bred cattle, which he approximates as applying to about 2 per cent. of the cattle in the country, which renders its possibilities exceedingly limited. On the subject of popular education, the doctor endorsed Mr. Glover's suggestion of making it a part of the course at agricultural colleges, as set forth with great emphasis in his paper. Dr. Reynolds then made a motion that a committee of three be appointed to consider the possibility of popular education through the aforesaid agencies. The doctor is very enthusiastic on the subject and addresses farmers' institutes throughout his state, and does much in the way of popular education as a result of that sort of work. During these addresses and visits, during the coming winter, he hopes to distribute about 5,000 copies of the primer prepared by the Inter-

national Commission on Tuberculosis, and published by the United States Department of Agriculture. Dr. D. F. Luckey, in speaking of popular education, said that he believed in beginning with the young people who had not formed set ideas. Carrying out that idea, the doctor gives lectures in the public schools, and demonstrates them by preserved specimens of tuberculous lesions. He believes that by thus explaining and demonstrating to these children while in a receptive state of mind, he can accomplish much more than he can accomplish at farmers' institutes; especially where there is a foreign element. The doctor spoke at 31 public schools during November last. Dr. M. E. Knowles, State Veterinarian of Montana, told of some very effective popular education carried on by himself in inviting farmers and stockmen to be present at the slaughtering of reactors. The doctor stated that 600 visitors were present on such an occasion at Helena, and 250 on another occasion at Mossula. Dr. Knowles says the public has become so interested in the subject of clean milk in his state, that they have begun to express themselves in poetry—a sample of which he read and which will be published in our next issue. Dr. G. Ed. Leech said he would just as soon drink a menagerie as a cemetery, from which we infer that he is not in favor of Pasteurizing milk. He does not favor the Bang system, because he thinks it does not pay the farmer. He laid great stress upon the necessity of careful training in the man who is to make the tuberculin test; he must be a diagnostician, not a mechanician, as it is not a merely mechanical procedure. Dr. Reichel, of Pennsylvania, stated that they are able to raise healthy calves on Pasteurized milk if removed immediately from their mothers who are reactors. Dr. S. H. Ward, of Minnesota, looks upon reactors as being dangerous and believes that all reacting animals should be slaughtered. He urges great care in making the tuberculin test, stating that young stock will run higher after inoculation than old stock. For example, a young animal may run up to 105, whereas an old one may only reach 102 under the same conditions. He believes that all tuberculin should be under the control of the Bureau of Animal

Industry. His state (Minnesota) has a law that provides for the reimbursement to butchers, of animals in which they find tuberculous lesions in the carcass. One of the benefits of the operation of this law, the doctor explains, is that it often leads to the discovery of tuberculosis, by pointing to the vicinity from which the butcher purchased the cow. Dr. A. D. Melvin, Chief of the Bureau of Animal Industry, summed up the matter in a paper. He said in part that forty-two states required animals to be tuberculin tested to be admitted within their borders for breeding purposes. He emphasized the fact that we must not lose sight of the value of physical examination in connection with the tuberculin test. He referred to dishonesty on the part of the person making the test as one of the principal causes of discredit of the test, and said he would like to see a law passed in every state causing the forfeiture of license to practice, of veterinarians making false reports. Dr. Luckey added that such a law is operative in Missouri.

The morning of the second day found the hall filled with enthusiastic listeners when Dr. A. W. Miller, of Iowa, presented his interesting and carefully prepared paper on "Dourine"; which was discussed by Dr. Gibson, of the same state, and several others. Both the paper and discussion were extremely interesting. A rare treat was then given the association in the form of a paper on "Sanitary Handling of Commercial Milk," by Prof. G. M. Whitaker, of Washington, D. C., followed by one on "Inspection and Regulation of City Milk Supplies," by Dr. Gottfried Koehler, of Chicago. Dr. Vander Slice, of Chicago, opened the discussion. He spoke of three grades of milk, as follows: Pasteurized, high grade or inspected milk, and certified. He believes that all dealers should be licensed annually, and should show themselves to be qualified to produce milk in a proper manner before being granted a license; just as a plumber or a barber is compelled to do before he can obtain a license to conduct his business. He spoke for certified milk, and stated that it does not require such a great amount of equipment to raise certified milk as is generally believed. He had seen a barn that

was less than the average in class, converted into a certified milk-producing plant for \$1,600. The doctor also referred to the elevating influence such a plant had on the neighboring farms; gradually and unconsciously they begin to improve. Dr. A. W. Evans, former Health Commissioner of Chicago, was asked by the chair to summarize the question, which he did in his usual masterly way, although he had not been fortunate enough to hear the papers. He said in part that there had been considerable speculation as to the relative nutritive values of raw and cooked milks. He believes that certified milk should be encouraged, but realizes that it cannot at present meet the demand nor the price, and clean, Pasteurized milk is the next best. Concentration of methods, rather than elaborate equipment; tuberculin testing and cleanly methods. He believes that when the sterilizing of milk in sealed bottles can be perfected, the matter will be much simplified. The only thing required is the proper form of bottle, and it can be accomplished just as easily as beer is now sterilized in sealed bottles. The doctor believes that for feeding babies, much benefit would be felt by a revival of the city dairies. Cleanliness, temperature and freshness are important factors in the production of a good milk for baby food; and milk produced two hours away from the baby is superior to that produced twelve hours away. Hence, the advantage of having the cows in the city limits. Hon. Raymond A. Pearson, Commissioner of Agriculture of New York State, was asked by the chair to say a few words, and stated, among other things, that there were four things necessary to the production of good milk—materials, methods, men and money. He emphasized the necessity of method; cleanly methods; and referred to the universal adoption of the covered milk pail, which he regards as an essential to cleanliness. The Commissioner believes in licensing milkmen and encourages popular education. He believes that the farmers are more willing to produce better milk than the consumers are to pay for it. He urged giving especial attention to the quality of dairy inspectors, and emphasized the importance of a standard which would improve the type. A number

of other important papers were presented, some running into the evening, among which were "Hog Cholera," by Dr. M. H. Reynolds, and "Experiences in Eradicating Tuberculosis from a Herd," by Dr. N. S. Mayo, at which we were unable to be present and therefore cannot give our readers the benefit of the discussions on them. At the conclusion of the evening session the association elected Dr. M. P. Ravenel to the executive office and re-elected Prof. J. J. Fergusen as secretary. Drs. Forbes, Niles, Hicks and Bahnsen and Mr. Chittick were elected as vice-presidents. This selection of men to fill the offices exemplifies the breadth of the organization. Its president is an M. D., four of the vice-presidents are veterinarians, the fifth a sanitarian, but a layman, and the secretary-treasurer a professor of animal husbandry.

The morning following the close of the Live Stock Sanitary Association meeting held in store for the visiting veterinarians at Chicago the meeting of the Illinois Veterinary Medical Association, and the inspection at the stock yards of about 140 head of cattle that had been previously tested under the direction of Dr. Mohler by the ophthalmic and intradermal methods; and the veterinarians divided themselves up between the two attractions. Those that attended the Illinois state meeting in the morning went with that association to the plant of the Abbott Alkaloidal Company at Ravenwood Station in the afternoon, and those that went to the stock yards in the morning spent the afternoon with Chief Melvin and Drs. Mohler and Hickman, chiefs of the two great divisions of the B. A. I. at Washington; Dr. Behnke, Associate Chief, and Drs. Bennett, Day and Siegmund, of the Chicago force, watching the slaughtering of the tested cattle and observing the post-mortem lesions; a golden opportunity for studying the relative value of the two tests in question, and also their relative value as compared with the present tuberculin test.

In the evening *all* met around the festive board as guests of Dr. W. C. Abbott, and after partaking of a generous repast, remained to ask and answer questions, as that was the program for the evening of the Illinois meeting. The papers were re-

served for the next forenoon and the evening was given up to the "question box," which proved both interesting and instructive. After the reading of the papers the following day, the entire afternoon was given up to a surgical clinic at the Chicago Veterinary College. And during all this time, as stated in the beginning, there was the Live Stock Show at the great stock yards, where the finest of horses, cattle, sheep and hogs were on exhibition, and, in addition, pen after pen of selected carload lots of the finest of all breeds of cattle in the open yards. And finally, on Friday morning, a small party of veterinarians from the East were escorted through the canning plant of Libby, McNeil & Libby, through Swift's up-to-date butterine plant, Armour's place and several other places of interest by Dr. S. E. Bennett, Veterinary Inspector in Charge at Chicago, and Dr. A. E. Behnke, Associate Chief, Inspection Division, B. A. I., Washington, D. C. So we believe our readers will approve of the caption, "An Educational Week in Chicago." We are also able to promise them a secretary's report of these meetings in our next issue, the foregoing being merely a summary. Our impressions.

THE ACTUAL CAUTERY FOR THE RELIEF OF ROARING—The actual cautery as a curative agent for roaring has lately been demonstrated by Dr. M. H. McKillip, of Chicago. The operation is performed through an opening in the crico-thyroidian ligament. The cautery is introduced into the ventricle and the mucous membrane cauterized. The operation can easily be performed without cutting any of the cartilages or without a general anaesthetic.

MEETING OF COMMITTEE ON FIFTIETH ANNIVERSARY OF AMERICAN VETERINARY MEDICAL ASSOCIATION—Dr. John F. Winchester, chairman, announces a meeting of the above committee at Reissenweber's, Fifty-eighth street and Eighth avenue, on Wednesday evening, January 17. There should be no difficulty in getting out a full attendance of the members of the committee, as the "Smoker" of the Veterinary Medical Association of New York City (see page 516) will be held at that hostelry the same evening, and veterinarians come from *everywhere* to attend that function.

ORIGINAL ARTICLES.

THE RESULTS OBTAINED IN THE ERADICATION OF TUBERCULOSIS FROM A HERD BY THE USE OF TUBERCULOSIS VACCINE AND THE BANG SYSTEM.*

BY S. H. GILLILAND, V.M.D., M.D., FORMER STATE VETERINARIAN AND SECRETARY OF THE STATE LIVESTOCK SANITARY BOARD OF PENNSYLVANIA.

(From the Laboratory of the State Live Stock Sanitary Board of Pennsylvania.)

In 1902 Dr. Leonard Pearson and the writer published "Some Experiments Upon the Immunization of Cattle Against Tuberculosis," and their conclusions were as follows:

"1. That after repeated intravenous injections of cultures of tubercle bacilli from human sputum, the resistance of young cattle to virulent tubercle bacilli of bovine origin may be increased to such an extent that they are not injured by inoculation with quantities of such cultures that are capable of causing death or extensive infection of cattle not similarly protected.

"2. That by intravenous injection much larger quantities of human sputum tubercle bacilli than are necessary to confer a high degree of resistance or immunity upon the vaccinated animal may be administered without danger to that animal."

Since that time many others have reported upon experiments with the object of increasing the resistance of cattle toward the tubercle bacilli. Among these have been Von Behring, Hutyra, Klimmer, Schultz, Arloing, Courmont, Moussa, Neufeld and

*Read before the Forty-eighth Annual Meeting of the American Veterinary Medical Association, Toronto, Can., August 22d-25th, 1911.

Meisner, Vallee, Weber and Fitze, Eber, Mohler and Schroeder, Trudeau and Baldwin, and many others in this country and abroad have done much work upon the subject.

Owing to the great volume of literature on this problem, I shall not attempt to incorporate an abstract of the same in this paper.

In 1904 Dr. Leonard Pearson was called upon to give advice relative to the eradication of tuberculosis from a herd consisting of approximately 200 head of cattle, including dry cows, bulls and heifers over one year of age. At the conference it was decided that the herd should be carefully tested with tuberculin, all reactors to be removed from the main barn and kept rigidly isolated from non-reactors. The herd consisted of thoroughbred Guernseys, Holsteins and grades, and it was further agreed upon that if any of the most valuable animals should react they were to be isolated, placed upon the Bang system, and to be treated with tuberculosis vaccine with the object of saving their offspring. This work was placed in my charge, and has been under my direct supervision since the start.

A thorough tuberculin test was made during May, 1904, of the milking herd consisting of 160 animals, of which 42 animals, or 26.2 per cent., reacted. Calves under eight months of age were excluded from the test, owing to the fact that the preliminary temperatures were too high to make the test of any value.

The reacting animals were removed immediately from the herd. A number of these animals were registered, some of which had taken prizes at the Buffalo Exposition in the Guernsey class. Nearly all of these reactors were in various periods of gestation, and it was considered advisable to keep them for their offspring. They were placed in a stable approximately 100 yards from the stables in which the main herd is kept, and situated at the foot of a hill, thereby permitting no drainage from this infected stable to the other buildings. It was the duty of one man to care for these reactors, and he was *not* permitted to mingle with the employees of the milking herd, visit the stables, or to allow

any interchange of utensils such as buckets, forks, shovels, wheelbarrows, etc., from the infected stable to any of the other stables. I shall refer to these reactors later in the article, but will now ask your attention to the care of the milking herd.

The main milking herd was stabled in four barns, varying from 12 to 48 animals in each barn. Inasmuch as some reactors had been found in every barn, a thorough disinfection of all stables was made. The windows and doors of the barns were tightly sealed and the interior filled with formaldehyde gas, the gas being generated by the addition of potassium permanganate to formalin, and left sealed for 18 to 20 hours; after which the doors and windows were opened and the stable thoroughly aired. The woodwork and iron stanchions were washed with a solution of carbolic acid. The floors in all the stables except one were of cement, and were flushed with a solution of sulphate of iron and afterwards carbolic acid. A coat of whitewash including 2 per cent. carbolic acid was applied to the ceiling and walls. The manure was removed to the fields, and the pit in which it was stored was covered with chloride of lime. The policy of this farm is not to pasture their milch cows, but to place them in a shady exercising yard a portion of the day. This yard was scraped, removing several inches of earth, and then covered with lime. All utensils around stables were disinfected.

Even with the disinfection as outlined it was believed that there still might remain some possible points of infection in the stables or exercising yards. Also, it seemed reasonable to believe that some non-reactors might carry within their body some tubercle bacilli which had not as yet had time to produce a distinct tubercle and therefore were incapable of giving a tuberculin reaction.

The method outlined at that time to eliminate all the suspicious animals and keep the herd free from tuberculosis was as follows:

First—All the animals in the milking herd were to be tuberculin tested every six months until two successive negative tests were obtained and then yearly thereafter.

Second—The calves that were intended to become future members of the milking herd were to be immunized by the use of intravenous injections of human tubercle bacilli which had been found by experimentation to be non-virulent for cattle.

Third—All cows newly purchased, before being allowed to enter the main herd, were to be placed in a quarantine stable about one hundred and fifty feet from the regular barns in which the milking herd was kept and then tested with tuberculin.

I do not consider this plan the best method for handling newly purchased animals, as there is a chance of reinfecting the herd. It appears to me that it would be far better if a regular quarantine barn could be maintained at least one hundred yards from the main buildings and all recently purchased animals be kept therein for a period of three months before entering the herd. This plan would permit of a tuberculin test at the time of purchase as well as another test just prior to entering the herd. In this manner it would be possible for one to detect any animals that were "plugged" by a dishonest dealer.

In the spring of 1905, approximately one year from the first test, the herd was again tuberculin tested. Conditions arose which made a tuberculin test six months following the initial test, as originally planned, impossible. The results obtained were as follows:

Date of test, June, 1905—

Number of animals tested.....	120
Number of animals reacted.....	13
Percentage of animals reacting.....	10.8

It was generally customary to apply the tuberculin test during the cool months of the fall and spring.

The tuberculin test in November of the year 1905, which was approximately five months from the preceding test, resulted as follows:

Number of animals tested.....	137
Number of animals reacted.....	7
Percentage of animals reacting.....	5.1

The tuberculin tests following the date above mentioned up to the present time gave the following percentages of reaction:

Results of Tuberculin Tests, 1906.

Date of test, April—

Number of animals tested.....	154
Number of animals reacted.....	13
Percentage of reacting animals.....	8.4

Date of test, November—

Number of animals tested.....	137
Number of animals reacted.....	5
Percentage of reacting animals.....	3.6

You will note that the percentage of reactions obtained in April, 1906, was 3.3 per cent. higher than those obtained in November, 1905. The only explanation I can offer for this is the fact that during the winter months the animals were more closely stabled and were frequently changed from one stable to another. Again, there were a number of newly purchased animals entered into the herd during the winter which had only been tested at the time of purchase, and were not kept for any length of time separate from the main herd after their arrival at the farm.

I believe it is of value in the elimination of tuberculosis from a herd for each animal to have a certain stanchion or stall in which it remains during its time of service in the herd.

Results of Tuberculin Tests, 1907.

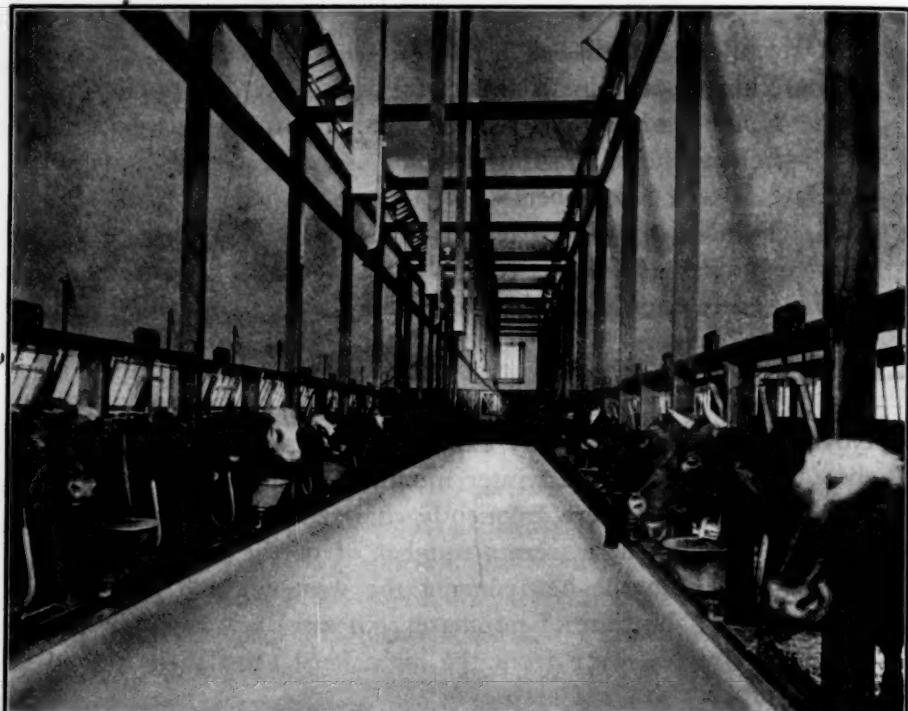
Date of test, April—

Number of animals tested.....	201
Number of animals reacted.....	0
Percentage of reacting animals.....	0

Date of test, October—

Number of animals tested.....	131
Number of animals reacted.....	0
Percentage of reacting animals.....	0

At the time of the October test there was one cow exhibited a rise in temperature to 104° F. at the sixteenth hour following injection, though all the temperature measurements prior to the



SHOWING METHOD OF VENTILATION, STABLING, FEEDING, WATERING, ETC.

sixteenth hour, as well as those following the sixteenth hour, were below 102.5° F. Therefore she was not considered a positive reactor, though she was removed and isolated from the herd for six months, when she was again tuberculin tested and gave a perfectly clean test and has continued to do so up to the present time.

Results of Tuberculin Tests, 1908.

Date of test, April—

Number of animals tested.....	145
Number of animals reacted.....	2
Percentage of reacting animals.....	1.4

Date of test, November—

Number of animals tested.....	169
Number of animals reacted.....	3
Percentage of reacting animals.....	1.8

The only explanation that I can offer for the reinfection of the herd is that during this year the attendant of the tuberculous animals upon the Bang system severed his connection with the farm and another man was obtained to do his work who was not as careful in seeing that there was no interchange of utensils used in the barn containing the tuberculous cows and the stables of the main milking herd. In investigating the matter I also was informed that he would constantly associate with the employees in charge of the milking herd.

Result of Tuberculin Test, 1909.

Date of test, April—

Number of animals tested.....	151
Number of animals reacted.....	0
Percentage of reacting animals.....	0

On account of obtaining no reactions on this test and having a fear of injecting tuberculin too frequently, thereby destroying the sensitiveness of the body cells to the same, no other test was made until the following year.

Result of Tuberculin Test, 1910.

Date of test, May—

Number of animals tested.....	151
Number of animals reacted.....	5
Percentage of reacting animals.....	3.3

The explanation for the reinfection of the herd the second time is as follows: At the time of the test in November, 1909, two cows gave a rather definite reaction. Inasmuch as they were valuable animals it was the owner's desire that they be held for a retest, which was granted. The history and tuberculin test of

these two animals is rather interesting, and I shall give the same in detail. The animals are known as Proceda and Francelmar. The test of 1908 in which they gave positive reactions is as follows:

Tuberculin Test, November 20, 1908.

	Proceda— Preliminary Temperatures.	Francelmar— Preliminary Temperatures.
5 a. m.....	101.4	101.4
7 a. m.....	102.	102.
9 a. m.....	101.6	101.8
11 a. m.....	101.6	101.6
1 p. m.....	100.6	100.2
3 p. m.....	101.	101.6
5 p. m.....	101.6	102.4

8 p. m., injected—dosage, 1 drachm of solution for each animal containing 1,200 milligrams concentrated tuberculin.

November 21, 1908.

	Temperatures Following Injection.	Temperatures Following Injection.
5 a. m.....	101.4	100.6
7 a. m.....	102.2	101.4
9 a. m.....	102.2	100.8
11 a. m.....	102.4	101.6
1 p. m.....	104.6	102.2
3 p. m.....	106.6	104.
5 p. m.....	105.	105.
7 p. m.....	105.4	106.

I beg to call your attention to the fact that the rise of temperature did not occur until the seventeenth hour, though the reaction in both cases was very distinct. There have been many cases come to my attention while State Veterinarian of Pennsylvania and at other times when the veterinarian applying the tuberculin test felt that it was not necessary to take more than three temperature measurements following the injection of the tuberculin, and that these measurements need not be taken after the sixteenth hour. It seems to me that we have ample proof to show that this is a very erroneous way of applying a test as valuable as the tuberculin test, and in this manner many animals have escaped.

These two animals were removed from the milking herd and placed in a barn some distance from the main stable and were attended by a party who had no connection with the milking herd, but who attended to a bull and a lot of calves which will be mentioned later. They were kept separate and their milk pasteurized for a period of eighty-two days, when they were again tuberculin-tested with the following results:

Tuberculin Test, February 10, 1909.

	Proceda— Preliminary Temperatures.	Francelmar— Preliminary Temperatures.
5 a. m.....	102.4	102.4
7 a. m.....	102.	102.1
9 a. m.....	99.4	101.2
11 a. m.....	99.4	100.4
1 p. m.....	100.4	100.8
3 p. m.....	100.6	101.
5 p. m.....	102.2	101.4

8 p. m. injected—dosage, 1 drachm of solution for each animal, containing 1,200 milligrams concentrated tuberculin.

February 11, 1909.

	Temperatures Following Injection.	Temperatures Following Injection.
5 a. m.....	102.6	100.6
7 a. m.....	102.4	101.4
9 a. m.....	100.6	101.
11 a. m.....	101.2	102.
1 p. m.....	103.	102.2
3 p. m.....	101.2	101.4
5 p. m.....	103.	101.6
7 p. m.....	102.6	....

It will be noted that the one animal gave a temperature at 1 p. m. of 103° , and again at 5 p. m. of 103° , but the intermediate temperature at 3 p. m. was normal, and it was considered that the irregularity in the temperature measurements was due to some other cause rather than tuberculosis. It has not been the experience of the writer that a tuberculous animal will give a rise in temperature, a fall, and then another rise following the injection of tuberculin unless there has been some local cause for the same, such as undue excitement, drinking cold water, feeding, milking, etc. Following this test, which was considered negative, these animals were returned to the milking herd. They were again tested on April 27, 1909, and May 4, 1910, at which time they both gave negative tests.

During the latter part of the summer of 1910 it was noticed by the superintendent of the farm that these two animals aforementioned were not in the best of condition and were, therefore, again removed from the herd and kept separate for several months, during which time they continued to lose flesh, coat became rough and cough increased. This action was taken by the superintendent during my absence abroad, and upon my

return I advised the killing of these two cows. The autopsy revealed extensive tuberculosis of the glands and other organs of both the thoracic and abdominal cavities.

This experience, taken in conjunction with a number of others that I have had during the past two years, leads me to believe that an animal that has once reacted to the tuberculin test in a positive manner must be considered a tubercular subject, no matter what subsequent tests may reveal. It may be, however, that some reactors will live for a number of years following the date of their initial reaction without showing any clinical symptoms of tuberculosis.

It is my belief that these two animals, namely Proceda and Francelmar, are responsible for the reinfection of the herd and of the percentage of reactions obtained during the year 1910.

As aforesated, five animals reacted during this year. One was an animal that had been purchased in New York since the previous test. Another was an animal that had been purchased by an employee of the farm three or four months prior to the injection of tuberculin. This animal, however, was kept separate from the herd, but the owner was constantly associated with the milch cows as he had a certain number of animals to feed, milk and care for each day. The third animal was one that had been vaccinated with tuberculosis vaccine for two years previous, and at the time of test showed an enlargement of the left fore knee joint. The reaction in this animal was not typical, but it was decided to sacrifice the same in order to determine the cause of the enlarged knee. Upon autopsy it was found that the bursa, through which the anterior extensor runs, was greatly enlarged, indurated and inflamed. No macroscopical lesions of tuberculosis could be found. Microscopical examination revealed no tubercle bacilli, and guinea pigs inoculated with this material remained healthy for a period of three months, when they were killed, and all organs, membranes, etc., were found normal.

The remaining two reacting animals had been in the herd for more than two years and upon autopsy showed small progressive foci of tuberculosis in the various glands and organs.

The herd was not again tested for nine months, with the following results:

Result of Tuberculin Test, 1911.

Date of test, January—

Number of animals tested.....	160
Number of animals reacted.....	4
Percentage of reacting animals.....	2.5

Four other animals which had received several years prior to the test four doses of tuberculosis vaccine, gave rather suspicious reactions and were removed from the herd, though two of them are not included in the above percentage of reactions, for upon autopsy they showed no lesions whatever.

It was not possible for the writer to be present at the autopsies, though Dr. B. T. Woodward, of the Bureau of Animal Industry, and Dr. W. L. Moss, of Johns Hopkins, conducted the same, and I have the following report from Dr. R. W. Hickman, Chief of the Quarantine Division of the Bureau of Animal Industry.

“ Referring to cattle * * * which were slaughtered at the Baltimore Butchers’ Abattoir, Baltimore, Md., January 31, and post-mortem examinations by Dr. B. T. Woodward, of this office, together with your representative, you are advised that the cow Turby immunized showed a supra-mammary gland the appearance of which was suspicious of tuberculosis. This tissue was submitted to the pathological division of the bureau and two guinea pigs were inoculated February 2. When examined at autopsy on March 7, both of these test animals were found to be tuberculous.

“ The tubercle bacilli in both instances were similar in appearance and were composed mainly of individuals of medium, long and in some cases slightly curved formation, but experiments were not made to determine other characteristics which would justify their definite classification into the human type.

“ ‘ Masher’s Repose,’ immunized, showed a suspicious supra-mammary gland, but tubercle bacilli were not demonstrable microscopically or through the inoculation of guinea pigs.

“ ‘ Proda’s Sultana 2d,’ immunized, showed haemorrhagic bronchial glands.

“ ‘ Dewey’s Ship,’ immunized, showed slight calcified areas in a sub-lumbar gland.

“ All carcasses were passed for food.”



CARE USED IN KEEPING ANIMALS AND STABLE CLEAN.
METHOD OF MILKING.

The animal Turby, which showed no macroscopical lesions, though the suspected material from the supra-mammary gland when injected into guinea pigs was capable of producing generalized tuberculosis, was given her first dose of tuberculosis vaccine March 7, 1909, and four subsequent doses between the time mentioned and January 27, 1910. During this time she

was allowed to mingle with the other members of the herd which were believed not to be infected. However, the test of 1910 showed that the herd contained affected animals, and it is probable that this particular animal may have become infected during this time, inasmuch as it is known that an animal has less resistance for a short time (4 to 6 weeks) following the vaccination than normal.

In the case of the second immunized animal, "Dewey's Ship," another explanation can be offered. This animal was first vaccinated against tuberculosis on January 30, 1905, and received three vaccinations ending June 15, 1905, and it is within reason to believe, with the knowledge at hand, that the immunity conveyed by the vaccine had been lost in the length of time.

To briefly summarize the results obtained by the application of the tuberculin test, I herewith give the following table:

	Percentage.
1904	26.2
1905.	
June	10.8
November	5.1
1906.	
April	8.4
November	3.6
1907.	
April	0
October	0
1908.	
April	1.4
November	1.8
1909.	
April	0
1910.	
May	3.3
1911.	
January	2.5

It is of interest to know that during a part of the period above mentioned two bulls which had reacted to the tuberculin test but showed no clinical evidence of tuberculosis, were used for breeding purposes in connection with cows in the main milking herd. This was done in order to obtain the offspring, as the bulls in question were considered to be of the best Guernsey blood in this country. Both animals during their period of service were kept by themselves, entirely separate from the herd, in a specially constructed barn allowing plenty of light and ventilation, with a large exercising yard enclosed by a plank fence five feet high. The following rules were carefully observed in the case of these animals as well as in breeding cows to them:

I.—The animal is at all times to be kept well isolated from the main herd in a specially constructed stable and is to be attended by an employee who has no connection with the other cattle.

II.—All utensils used in his care, such as buckets, brooms, forks, halters, feeding boxes, brushes, curry combs, etc., are under no condition to be removed from his stable and taken to another stable unless they are thoroughly cleansed and disinfected with a 5 per cent. solution of creolin or carbolic acid.

III.—He is to have a special halter and lead pole that must never be used for any other animal.

IV.—A special place, preferably close to his stable, should be selected for service, and no circumstance should permit him to be taken into the yards or stables of the main herd.

V.—After a cow has been served by him they should be separated at once and the cow sponged with a 3 per cent. solution of creolin or carbolic acid *before* being returned to the main stable.

After 18 months or more of service it was noticed that these bulls began to lose flesh and exhibit other symptoms indicating the advancement of the disease. Their use as sires was discontinued and later they were killed, and upon autopsy showed generalized lesions of tuberculosis. Even though precautions were taken to prevent these animals from endangering the herd, it is

possible that they may have been partially responsible for a percentage of the reactions obtained.

It seems unfortunate that this herd should have been freed from tuberculosis twice and as many times reinfected. However, I do not believe that it is possible to keep a herd entirely free from tuberculosis in which new animals are being constantly purchased and entered into the herd upon the tuberculin test at the time of purchase. After a herd has been gotten free of tuberculosis, the best manner to keep from reinfesting the same is to endeavor to raise all animals needed for future milkers from the tuberculous-free cows on the farm.

We shall now consider the second phase of this problem, namely, the value of the immunization of the young calves intended for future members of the herd by the use of tuberculosis vaccine.

The vaccine consists of tubercle bacilli of the human type which have been found to be non-virulent for cattle, suspended in normal saline solution. The particular culture known as Culture M, used in the herd referred to, was obtained from the sputum of a young girl. The sputum upon microscopical examination contained vast numbers of tubercle bacilli. Each microscopic field showed fifty to one hundred bacilli. There did not appear to be any extensive pulmonary tuberculous process upon clinical examination. The culture was isolated in 1901 and its virulence was carefully tested upon guinea pigs, rabbits, calves, sheep and horses. It was found, if given in larger quantities to bovine animals, it was incapable of producing lesions of tuberculosis. These injections were made subcutaneously, intraperitoneally and intravenously.

The suspension of the tubercle bacilli in the salt solution used for the vaccination work was made so that 1 c.c. of the suspension represented 1 milligram of dried tubercle bacilli. Fresh cultures were used and no vaccine was prepared more than thirty-six hours prior to injection. The vaccine was injected directly into the jugular vein.

During the years 1904, 1905 and 1907 it was the policy to give the calf the first vaccination when three or four weeks of age, and subsequent vaccinations at intervals of four to five weeks. Since 1907 the calves have been taken away from their dams soon after birth and placed in a stable specially constructed for their care and which can easily be disinfected at any time. Believing that there was *no* danger of the calves contracting tuberculosis while kept in this stable and fed upon pasteurized milk, the initial vaccination was not given until the animal had attained the age of at least eight to ten weeks. The interval between subsequent vaccinations was also lengthened.

Dr. Leonard Pearson and the writer discovered about this time that it was important, if one wanted to obtain success in increasing the resistance of cattle against tuberculosis, to keep the animals during and for not less than six weeks following the last vaccination in a manner in which there would be no possible chance of infection. It appears that the normal resistance of an animal is lowered during the period of vaccination.

During the year 1904 there were thirty-two calves vaccinated with vaccine prepared after the method above outlined. The number of doses given was three, the first consisting of $2\frac{1}{2}$ c.c., the second of $4\frac{1}{2}$ c.c., and the third $7\frac{1}{2}$ c.c. After the third vaccination was completed these calves were turned to pasture and contracted lung worms (*Strongylus micrurus* or *Pulmonalis*), and twelve of them died from the same. There are six of these animals in the herd at the present time and the remaining number have either been sold as milch cows or slaughtered for beef, owing to the fact that they did not produce a sufficient number of pounds of milk yearly to warrant keeping them in the herd. It has been the policy of this farm to have a standard number of pounds of milk for each breed, and if the animal falls below this standard during a period of lactation it is disposed of to the butcher.

In 1905 there were forty-two calves vaccinated, each animal receiving four vaccinations, the initial dose being 1 c.c., the second dose $2\frac{1}{2}$ c.c., the third dose 5 c.c., and the fourth dose

7½ c.c. Six of these animals are in the herd at the present time. The others have been disposed of either for beef or sold to other parties for dairy purposes.

For the year 1906 the records show that thirty-eight animals were vaccinated, receiving three vaccinations, the dosage consisting of 1, 3 and 5 c.c. respectively, and extending over a period from May 14 until September 5. Of the number vaccinated during this year there are six remaining in the herd.

Twenty-two animals were vaccinated in the year 1907, the majority of which received four vaccinations, over a period from October 23, 1907, to March 23, 1908. The doses consisted of 1 c.c., 2½ c.c., 4 c.c., and 6 c.c. Two of these animals received but three vaccinations and three animals received but two vaccinations. Of the twenty-two animals vaccinated there are eight in the milking herd.

During the years 1908 and 1909 there were fifty animals vaccinated, forty-one of which were given ten vaccinations, covering a period of approximately one year's time. The increased number of vaccinations were given in order that another experiment could be started to determine whether the milk of animals hyper-immunized had any protective value against tuberculosis. This experiment is under progress at the present time and the results will be published at a later date. The remaining nine animals vaccinated during the two years above mentioned, received four vaccinations covering a period of six months. All of these animals are still members of the herd except five, which have either been sold or slaughtered for meat purposes.

Only one-half of these animals have given birth to their first calf and are members of the milking herd, though they are kept in a separate stable some distance from the main barn owing to the fact that they have not lost their sensitiveness to tuberculin and will react if injected with a regular dose of the same. It is the owner's desire to have his main milking herd known as one that contains no tuberculin reacting animals. This is also a regulation of some of the larger cities in which the milk is sold.

To briefly summarize, we find that since 1904 we have vaccinated 184 calves, of which forty-six are in the main milking herd at the present time. Of the 143 animals that were sold for breeding purposes, for beef, or that died from lung worms, etc., post-mortem examinations were obtained on approximately 100 head and no lesions of tuberculosis were found in any except those aforementioned following the tuberculin test of 1911.

There were no calves vaccinated that were born in the years 1910 and 1911, as most of these calves the owner desires to sell to parties in either his own state or in other states. It has been found that animals receiving tuberculosis vaccine will react to tuberculin for a certain length of time following the final vaccination. This reaction to tuberculin interferes with interstate shipments, and for this reason the vaccinations were discontinued for the period aforementioned, but it is my intention to vaccinate all calves this fall that have been born during the summer months and are desired for future members of the herd. This decision has been brought about by the fact that a few months ago a lot of fourteen calves that were stabled in a barn which had been previously used to keep reacting animals in, seemed to be unthrifty. One of these calves died from some unknown cause and upon post-mortem examination a suspicious lymphatic gland was found. Upon section it showed no distinct tubercle formation but was sent to Johns Hopkins University for microscopic examination, and tubercle bacilli were found in the smears made from the same. This stable before the calves were placed therein had been thoroughly disinfected. In order to determine the extent of infection of this lot of animals, six of the others were killed after having given positive tuberculin reactions, and upon autopsy showed incipient active foci of tuberculosis. These animals had not received any tuberculosis vaccine. The remaining animals of this lot which did not react to tuberculin will be carefully watched and not allowed to mingle with other members of the herd until they have been given another negative tuberculin test.

It is of interest to know that this particular lot of calves were taken care of by the same party who had charge of the two cows aforementioned, that is, Proceda and Francelmar, which were killed upon physical examination. This may have been the source of infection of this lot of calves.

It is my belief that if these animals had been vaccinated with tuberculosis vaccine within eight or ten weeks following their birth, they would have had sufficient resistance to withstand the slight infection to which they were subsequently exposed.

Vaccinated animals have been tuberculin tested at intervals of one month from the third month to the twenty-fourth month following the final vaccinations in order to determine at what period they lose their sensitiveness to tuberculin. The time when the sensitiveness is lost has been found to be rather irregular, varying from six months to nineteen months. It is not my belief, however, that the sensitiveness to tuberculin has any relation to the degree of immunity that the animal may have against tuberculosis.

We come now to consider the animals which had reacted to the tuberculin test and were considered to be of sufficient value to be placed upon the Bang system with the main object of saving their offspring. From the reacting animals in 1904, twenty-four cows, heifers and bulls were saved. In 1905 there were eleven animals reserved for this purpose.

These animals were thoroughly isolated from the main milking herd, attended by one man, and the milk was adequately pasteurized before being used for any purpose.

In 1904, Dr. Leonard Pearson and the writer published an article entitled, "The Effect of Tuberculosis Vaccination Upon Cattle Infected with Tuberculosis." The experiment was made upon twelve yearlings of the Shorthorn breed. The animals were approximately the same age and size and had, just prior to the starting of the experiment, reacted to the tuberculin test. It was believed that the lesions they contained were not far advanced and they would be good subjects for such work. In conclusion, the article states: "We believe we have sufficient evi-

dence to justify the statement that the treatment to which six of the animals were subjected had the effect of not only keeping in check the progress of a tuberculous process, but in causing a distinct and in some cases a great retrogression of the lesions. In other words, the treatment had a distinct curative effect." With this knowledge at hand it was decided to keep the valuable reacting animals of this herd isolated and handle them in accordance with the Bang system, as well as to treat them with tuberculosis vaccine and tuberculin.

They were first given an intravenous injection of tuberculosis vaccine. The dose depended upon the age, size and physical condition of the animal and ranged from 4 c.c. to 10 c.c. of a standard suspension of tubercle bacilli of the human type. This was followed at intervals of seven days with increasing doses of tuberculin until three injections were given. Then a second injection of tuberculosis vaccine, the dosage being the same as the initial injection, was given. This was followed by three weekly injections of tuberculin, increasing the dose with each injection. Finally a third dose of tuberculosis vaccine was given, followed by weekly injections of tuberculin, increasing the dosage at each injection until the animal ceased to react.

I regret very much that I do not have a complete record of the offspring of these animals, but I feel safe from the information I have at hand to state that fifty per cent. of all calves born were saved.

The plan was to remove the calf from the infected stable as soon as dropped, sponge it thoroughly with a solution of creolin, remove it to non-infected quarters and to feed it artificially upon pasteurized or sterilized milk. In some of the animals the treatment seemed to have no beneficial results, while in others most encouraging results were obtained.

These animals were slaughtered at various times throughout the experiment, the last being killed April 19, 1907. In eight animals of the thirty-five animals in the experiment no macroscopical lesions of tuberculosis could be determined after a careful post-mortem examination. In ten of the remaining animals

only small calcareous lesions could be found. These were well encysted with a thick, hard, grayish, fibrous wall. The best results were obtained in those animals in which the initial lesion was small and inactive at the time the treatment was begun.

In conclusion, it is my belief where a herd that contains valuable animals both for breeding and dairy purposes, and in which there is over 8 per cent. of tuberculosis, the disease can be most easily and economically eliminated by applying the tuberculin test every six months combined with the use of tuberculosis vaccine and the Bang system, for reactors from which it is desired to save the offspring.

The use of tuberculosis vaccine has not as yet reached a practical stage and must remain in the hands of laboratory workers until more knowledge is obtained upon anaphylaxis, duration of immunity and the tuberculin test upon vaccinated animals.

To free a herd from tuberculosis it is necessary to have a quarantine barn for all newly purchased animals and to keep the same therein for a period of not less than three months before placing them with the main milking herd.

Before closing, I desire to acknowledge the valuable suggestions and advice given me by Dr. Leonard Pearson, who at all times was willing to assist me in every way possible. Further, I desire to express my thanks to Dr. E. S. Deubler and to Dr. E. L. Cornman for general assistance in making the tuberculin tests and the vaccinations of the young calves. I beg to acknowledge much assistance rendered me by Dr. F. A. Mackie and Dr. W. L. Moss in post-mortem examinations. I am also greatly indebted to the owner for his ready co-operation with all suggestions given, without which it would have been impossible to have continued this work.

We desire to correct a typographical error in the eleventh word of the first line in the last paragraph of Prof. Sisson's article on page 323, December REVIEW, and to apologize to the author for having let it get past us. The word "impossible" should read "possible."

BOVINE TUBERCULOSIS, ITS PROBLEM AND CONTROL.*

BY VERANUS A. MOORE, ITHACA, N. Y.

There is perhaps no single disease that has aroused more interest and that is of greater significance to the livestock industry of this country than bovine tuberculosis. In the evolution of the present knowledge of this affection there have been many findings of such apparent far-reaching significance that they have each in turn formed an independent basis for a somewhat definite line of procedure directed toward its elimination. The sanitarian, however, must not be content with partial findings nor hope for success by applying methods that are based on too few of the many phases in the complete cycle of the disease to be controlled. If we are to appreciate the problem of bovine tuberculosis and to grasp the principles involved in its control, we must put aside our theories, until the full array of facts is before us concerning the life history of its etiology, its channels of invasion and means of elimination together with an understanding of the tissue response to its entrance. When these are fully known, it will not be difficult to ascertain how to interpose a barrier that will inhibit its further spread. But when regulations for control are based on a few facts which do not include all of the essential processes of the disease, complete success cannot be expected. It has not infrequently happened that sanitary measures have failed completely when but a part of the truth concerning the nature of the disease was known. An illustration of this is found in the numerous methods tried with negative results for the control of malaria, after its cause was discovered but before it was known that it was carried by the anopheles mosquito.

In order to circumscribe the problem centered in the nature of bovine tuberculosis and the many obstacles to its eradication it may be well to review briefly the succession of discoveries concerning it and the conclusions immediately drawn from them

* Read at the Meeting of the United States Live Stock Sanitary Association, Chicago, December 5, 1911.

that have operated to bring about existing laws and regulations for its suppression.

The discovery of the tubercle bacterium by Koch in 1882 brought the subject of tuberculosis and man's responsibility concerning it for the first time clearly before the public. The masterly presentation of his findings seemed to leave no doubt of the identity of tubercle bacteria in mammals. This conclusion was accepted and leading bacteriologists of the time attested to its correctness. A new etiological factor had been revealed which possessed peculiar biochemical and pathogenic properties that differentiated it from all other microorganisms. This discovery brought tuberculosis clearly before the world as an unnecessary destroyer of man and beast, and initiated the first step in its control, namely, efforts to prevent infection.

The next epoch-making discovery was again the handiwork of Koch who in 1890 showed that the liquid on which tubercle bacteria had grown would produce a distinct temperature reaction when injected into tuberculous individuals. When this substance (tuberculin) was applied to cattle it was found that a much larger percentage was infected than was supposed and that many apparently healthy animals reacted and upon slaughter were found to be more or less diseased. The conclusions hastily drawn from these findings, namely, (1) that the large amount of tuberculosis in man was due to infection from cattle, (2) in order to check the disease in man it must be eliminated from cattle, and (3) that all cattle reacting to tuberculin were immediately dangerous to man and to other animals, were immediately availed of in the campaign against human tuberculosis. This led to extraordinary measures to eradicate tuberculosis from cattle. Health authorities assumed that tuberculin was sure in its response and that a single application would indicate all the infected animals in the herd tested. Working under these hypotheses the American system of control was legalized and many animals were tested and destroyed. The result was that many tuberculous herds were cleaned up completely but in others the disease reappeared and the efficiency of tuberculin was ques-

tioned. Difficulties of this nature were beginning to appear when a third important discovery was announced.

In 1898 Theobald Smith published the results of his researches into the relation of human and bovine tubercle bacteria. He found contrary to all previous statements that there were well marked morphological, cultural and pathogenic differences between them. In 1901 Koch read his famous paper in which he gave the world to understand that there was no relation existing between human and bovine tubercle bacteria. With that announcement there began one of the most intense investigations into the nature of a disease that has ever been recorded. For ten years a large number of competent men and women have been carrying on researches covering every conceivable phase of this great problem. The findings are quite unanimous in pointing out two distinct varieties of mammalian tubercle bacteria, one in man, the other in cattle, and in showing that children are sometimes infected with the bovine variety.

In addition to the question of identity or non-identity of tubercle bacteria, extended researches have shown the existence of many acid-fast bacteria widely distributed in nature that cannot be differentiated morphologically or by their staining properties, from true tubercle bacteria. Much, and more recently Schroeder, have described non-acid-fast organisms that produce a disease in Guinea pigs with lesions apparently not unlike those of tuberculosis. Thus each of the properties of tubercle bacteria that had long been recognized as possessing diagnostic value has been found to be insufficient in itself. This has made necessary a wider range of identifying tests, thereby greatly increasing the labor of the bacteriologist. These findings have brought clearly before us the phenomenon of the acid-fast group of bacteria and the difficulty in diagnosing tuberculosis from its etiology.

Further inquiries into the explanation for the action of tuberculin have tended to verify the theory of Eber as modified by Smith. This explains the oscillation between reaction and non-reaction in certain individual cases. According to this theory, tuberculin cannot cause a reaction where the progress of the

specific lesion is arrested, or where encapsulation exists. Thus it explains many of the seeming contradictions in the use of tuberculin and defines more clearly the conditions under which it can be trusted.

A further and equally valuable line of research has pointed out the class of tuberculous cattle that are spreading the virus and those that for the time being are not dangerous to others. Thus little by little the fuller nature of tuberculosis has been revealed until we have come to recognize that instead of dealing with a single question with a direct answer we are confronted with a series of complicated questions that depend for their answers upon vital and subtle forces which cannot be changed by the will or act of man.

The problem of control, however, is not restricted to the biological aspects of the disease. The practical side presents complications that are equally intricate and trying. The inefficiency of present methods for eliminating even advanced cases is shown by the constantly increasing number of tubercle bacteria in market milk. The steady demand for milk from the growing cities has revolutionized the former methods of handling milch cows. To keep up their milk supply throughout the year, farmers buy fresh cows and sell the dry ones. By reason of this a throng of living cattle is constantly passing through our dairy districts. Many of these animals are infected but they continue with the others until they become well advanced cases and spreaders of the virus before they are dispatched.

The American system of control which consists in tuberculin testing dairy cattle and slaughtering the reactors, was among the first to be inaugurated. It was started when the authorities believed (1) that human and bovine tubercle bacteria were identical and (2) when tuberculin was thought to give a reaction in all infected animals. It started as an official measure and carried indemnity from the state for the infected animals. Such payment was justified on the ground of public safety and equity to the owners. With slight modifications the system has continued in operation since its introduction. Could this method have been introduced soon after the infection occurred, it would have been

successful generally as it has been in certain localities and in single herds where all tuberculous cattle seem to have been identified and eliminated. Unfortunately in point of time it came so late that in many states there were too many infected animals for the available funds as well as too large a number of arrested cases, so that a single test could not detect them all. As a result, the official use of tuberculin has been and still is restricted to a small percentage of the cattle. In New York it is less than two per cent. annually. Local boards of health and milk commissions have required testing of perhaps 5 to 10 per cent. more. But even this is not sufficient to insure any great decrease in the number of tuberculous cattle. A very large part of the remaining ninety per cent. is not tested. In these tuberculosis is continuing to spread according to its own methods. There is more or less private testing, but where the laws are too stringent dairy-men themselves are not active in finding the disease. The health authorities and often consumers will not permit the reacting cows to remain in the milking herd, although evidence of disease cannot be detected except with tuberculin. At the same time milk from herds that have never been tested and which often contain spreaders of the virus, as shown by an examination of the milk, is accepted.

A long and careful study of tuberculin has shown that with a reaction there is present an active tuberculous infection but its failure to react does not prove the absence of the disease.* Ex-

*Resolution 2, on tuberculin, passed by the International Commission on the Control of Bovine Tuberculosis, reads as follows:

1. That tuberculin, properly used, is an accurate and reliable diagnostic agent for the detection of active tuberculosis.
2. That tuberculin may not produce a reaction under the following conditions:
 - (a) When the disease is in a period of incubation.
 - (b) When the progress of the disease is arrested.
 - (c) When the disease is extensively generalized.

The last condition is relatively rare and may usually be detected by physical examination.

3. On account of the period of incubation and the fact that arrested cases may sooner or later become active, all exposed animals should be retested at intervals of six months to one year.
4. That the tuberculin test should not be applied to any animal having a temperature higher than normal.
5. That any animal having given one distinct reaction to tuberculin should thereafter be regarded as tuberculous.
6. That the subcutaneous injection of tuberculin is the only method of using tuberculin for the detection of tuberculosis in cattle which can be recommended at the present time.
7. That tuberculin has no injurious effect on healthy cattle.

perience has shown and theory explained that when infection exists either in the period of incubation or in a state of arrest tuberculin is not effective. These findings have answered many of the criticisms that have been raised against it. These are usually made by those lacking knowledge of when it can and when it cannot cause a reaction. Many of these important facts have been disregarded, and the system, while applied with good faith, has occasionally allowed infection to remain in the herd. In these the disease has sooner or later developed, and the herd has again become a center for dissemination. For this tuberculin has been unjustly blamed and not infrequently the integrity of the men who used it has been called in question. Unfortunately the use of tuberculin has come all too often to be considered synonymously with the slaughter of a herd and not as an agent of the greatest value in diagnosis.

Again the supposition that all reacting animals are immediately dangerous has been carefully investigated. Many examinations of milk, feces and saliva of infected cattle have been made to ascertain the extent to which open cases of tuberculosis exist without giving physical evidence of the same. This work is now in active progress but the results already reported* indicate that spreaders of the virus can be detected in a very large percentage of cases on physical examination. Such men as Ostertag and Poels trace failure to detect the "spreaders" to a lack of skill on the part of the examiner. Although our system of testing and destroying the reactors has been right so far as ideals go, in general its results do not seem to have surpassed or even to have equalled the attainments of the methods based on a broader knowledge of the disease and the dissemination of its virus.

*Moore and Boynton. N. Y. State Dept. Health, 29th Annual Report, i, 1908.

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The Elimination of Tubercle Bacteria from Infected Cattle. The Jour. of Med. Research, Vol. XXIV. (1911), p. 517.

Peterson. Report of the N. Y. State Veterinary College at Cornell University, 1910, 60.

Reynolds and Beebe. Dissemination of Tuberculosis by the Manure of Infected Cattle. Bulletin No. 103, Agric. Exp. Sta., Univ. of Minnesota, 1907.

Reichel and Deubler. An Examination of the Feces of Forty Cattle for Tubercle Bacilli and Conclusions. Jour. of Med. Research, XXIV., 1911, 5.

Schröder. The Unsuspected But Dangerously Tuberculous Cow. Circular 118, U. S. Bureau of Animal Industry, 1907.

In Europe there are in operation at least three methods for the control of cattle tuberculosis. The Bang method, named after its distinguished author, Professor B. Bang, of Copenhagen, consists in eliminating all of the clinical cases; in testing the remaining cattle with tuberculin; separating the reactors from the well and keeping them for breeding purposes. In Denmark, however, the farmer is allowed to sell the milk* from the reacting but clinically sound cows as well as the cows themselves and that country claims to hold the record of minimum tuberculosis in children. His method has been applied in over ten per cent. of the dairies of Denmark. The distinctive advantages of Bang's method are that it recognizes the property rights of the cattle owners; educates them in the nature of the disease, so that when their herds are finally freed from the disease they are able to keep them so; enables them to build up sound herds; and further it affords protection to the public.

The Ostertag method, generally applied in Germany, consists in frequent, thorough physical examination † of the cows and the removal of all suspicious cases. Tuberculin may or may not be applied. If it is used the reactors are not separated from the others. Its theoretical basis is that the disease can be detected by a careful physical examination before it has advanced sufficiently for the virus to escape. Ostertag states in his papers and he has told me personally, that the method, if rigidly carried out, will protect the milk from infection and eventually eradicate the disease from the herd. While it affords little or no protection for inter-herd control, it seems to be effective for intra-herd protection and eradication. Further it protects the consumers of milk in that it eliminates most if not all of the infected animals before they become spreaders.

The third European procedure is known as the Manchester method. It is followed more than any other in Great Britain.

*The milk that is taken to creameries and separated is always pasteurized before it is returned to the farm. Some of the people there, as in this country, buy milk from tuberculin-tested cows only.

†This method does not infer that infected cattle as a rule can be detected on physical examination. It is well known that but a small (3 to 5 percentage of infected cattle can be detected by this method.

It consists in making regular examinations of the market milk for tubercle bacteria. If they are found the herds from which the milk came are carefully examined and the cow or cows eliminating them are found and excluded. This method seems to deal with the immediately dangerous animals only. However superficial as a means of eradication it may seem, Delapin and Boyce report a far safer condition relative to tubercle bacteria in the market milk of Manchester and Liverpool than is indicated by the reports of similar investigations in our large cities.

After carefully studying these various methods, discussing them pro and con with their authors and examining the herds in which they are being applied, one cannot help but feel that in the eagerness to obtain at once absolute safety by eliminating all infected animals, the radical position taken in this country has tended to make haste slowly because it has purified but a few herds and left the others as they were. It would seem that the principle should be to eliminate first all cases that appear to be spreading the virus and to remove all of the infected animals from as many herds as possible. The methods suited to eradicate an acute destructive disease such as anthrax or one that might be introduced such as foot-and-mouth disease, are not applicable to a malady of such a chronic nature and so widespread and deeply rooted as tuberculosis is in the herds of this country. Again, with other cattle diseases the infected animals are practically worthless but with tuberculosis most of them retain for a time at least, their productive value.

Aside from its sanitary aspects the control of tuberculosis has an economic significance that cannot be overlooked. It was thought in Massachusetts and New York that the people would pay for and destroy all infected cattle. The records show that the maximum appropriations that could be secured for indemnity were woefully insufficient. Further, the method antagonized the owners and failed to bring about their cooperation, without which success is doubtful. The Bang method would be open to little or no objection in this country if dairymen could sell the milk from cows that have reacted to tuberculin but which

exhibit no physical evidence of the disease. At present our dairymen object to it because they have no way by which to dispose of the milk. Yet the milk from thousands of herds that have never been tested or even examined physically is accepted without question. Why is not milk from dairies containing reacting but clinically sound, *i. e.*, those in which lesions cannot be detected, cows quite as safe as it is from dairies where the cows have not been tested, in a country where tuberculosis is as prevalent among cattle as it is in this? The milk from infected cows is no less dangerous because they have not been tested, and conversely the milk from infected cows is a no greater menace after they are tested than it was before.

As the known facts relative to the nature and extent of bovine tuberculosis and the existing methods for its control are before us, it is clear that its biological problems are complicated by many perplexing administrative questions. Our task seems to be to adjust the disharmonies between existing regulations and the true nature of the disease. When the dairymen understand the facts and are given legal and moral encouragement to apply them, they will see to it that tuberculosis grows out of their herds more rapidly than it grew in. Instead of vainly looking for legislation to accomplish promptly beneficial results, let us direct our attention to the cattle owner and aid him in coming to an understanding of the true nature of his task. I deplore the sentiment so often expressed that dairymen are antagonistic to eliminating this or any other disease, for in most cases they are not. As a rule they are willing to reject all animals that their knowledge enables them to understand are diseased. The control of tuberculosis is largely an individual matter with the owners and they should be aided as much as possible. How they should proceed and what they should not be permitted to do in accord with our present knowledge have been clearly outlined in the report of the international commission on the control of bovine tuberculosis (see appendix for commission's plans). When all the beneficial results have been obtained that the suggestions in that report make possible, new knowledge on which to base new

methods will undoubtedly then exist to direct if necessary further procedure. I feel that any legislation that brings to the cattle owner hardships which are not called for by the true nature of the disease itself tends in the end to spread rather than check the infection. Knowledge and honesty are the two great potential factors in the control of bovine tuberculosis and these cannot be acquired by legislation.

APPENDIX.

Appendix E * of the Report of the International Commission on the Control of Bovine Tuberculosis—The Commission's Recommendations on Eradication—A Composite of the Methods of Bang and others.

The Commission after stating the known facts regarding the nature of tuberculosis and enumerating the principles to be observed in its prevention and eradication, recommends the following plan of procedure: It is recognized that in several points there are opportunities, in order to meet individual needs, to change or modify the directions herein given. It is understood, however, that whenever such modifications are made they should conform in the greatest detail to the principles laid down in the report of this Commission. The plan has for its purpose the conservation of the herd whenever that is possible.

The control of bovine tuberculosis involves a definite procedure under two distinct and different conditions, namely: (1) where a herd of cattle is free from tuberculosis and it is to be kept so, and (2) where one or more animals in the herd are infected and the purpose is to eradicate the disease and establish a sound herd.

PROCEDURE UNDER CONDITION ONE.

The prevention of tubercular infection in cattle, free from tuberculosis, consists simply in keeping tuberculous cattle or other animals away from the sound ones; in keeping tuberculous animals out of pastures, sheds or stables where the sound ones

* Published in the AMERICAN VETERINARY REVIEW, October, 1910, as a part of the report of the International Commission on the Control of Bovine Tuberculosis.

may be kept. Healthy cattle should not be exposed to possible infection at public sales or exhibitions. Raw milk or milk by-products from tuberculous cows should not be fed to calves, pigs or other animals. Cars that have not been thoroughly disinfected should not be used for the transportation of sound cattle. Cattle that are purchased to go into sound herds should be bought from healthy or sound herds only.

PROCEDURE UNDER CONDITION TWO.

The eradication of tuberculosis from infected herds requires for conservation of the herd different procedures according to the extent of the infection. For a guide to the control of the disease, tuberculous herds may be divided into three groups, namely:

- I. Where fifty per cent. or more of the animals are infected.
- II. Where a small percentage (15 per cent. or less) of the animals are affected.
- III. Where a larger number (15 per cent. to 50 per cent.) of the animals are diseased.

In eliminating tuberculosis from infected herds the following procedure is recommended:

Group I.

Herds where a tuberculin test shows fifty per cent. or more of the animals to be infected should be treated as entirely tuberculous. The procedure here is as follows:

1. Eliminate by slaughter all animals giving evidence of the disease on physical examination.
2. Build up an entirely new herd from the off-spring. The calves should be separated from their dams immediately after birth and raised on pasteurized milk or on that of healthy nurse cows. This new herd must be kept separate from all reacting animals.
3. The young animals should be tested with tuberculin at about six months old, and when reactors are found at the first or any subsequent test—the others should be retested not more

than six months later. When there are no more reactors at the six months' test annual tests should thereafter be made. All reacting animals should at once be separated from the new herd and the stables which they have occupied thoroughly disinfected.

4. When the newly developed sound herd has become of sufficient size the tuberculous herd can be eliminated by slaughter under inspection for beef.

Group II.

1. The reacting animals should be separated from the non-reacting ones and kept constantly apart from them at pasture, in yard and in stable.

(a) PASTURE. The reactors should be kept in a separate pasture. This pasture should be some distance from the other or so fenced that it will be impossible for the infected and non-infected animals to get their heads together.

(b) WATER. When possible to provide otherwise reacting cattle should not be watered at running streams which afterwards flow directly through fields occupied by sound cattle. The water from drinking trough used by infected animals should not be allowed to flow into stables, fields or yards occupied by sound animals.

(c) STABLE. Reacting cattle should be kept in barns or stable entirely separate from the ones occupied by the sound animals.

2. Calves of the reacting cows should be removed from their dams immediately after birth. Milk fed these calves must be from healthy cows, otherwise, it must be properly pasteurized. These calves should not come in contact in any way with the reacting animals.

3. The non-reacting animals should be tested with tuberculin in six months, and when reactors are found at the first six months, or any subsequent test, the others should be retested not more than six months later. When there are no more reactors at the six months' test, annual tests should thereafter be made.

All reacting animals should at once be separated from the new herd and the stables which they have occupied thoroughly disinfected.

4. The milk of the reacting animals may be pasteurized and used.
5. Any reacting animal which develops clinical symptoms of tuberculosis should be promptly slaughtered.
6. An animal that has once reacted to tuberculin should under no circumstances be placed in the sound herd.
7. As soon as the sound herd has become well established, infected animals should be slaughtered, under proper inspection.

Group III.

Herds that come within this group should be dealt with either as in Group II, where the herd is separated, or as in Group I, where all of the animals are considered as suspicious and an entirely new herd developed from the offspring.

GENERAL PRECAUTIONS.

In ALL cases animals that show clinical evidence of the disease should be promptly eliminated. They should be destroyed if the disease is evidently far advanced, if not, they may be slaughtered for food under proper inspection.

All milk from tuberculous cows that is used for food purposes should be thoroughly pasteurized. This means that it must be heated sufficiently to kill or to render harmless, any tubercle bacilli that may be present in it. For this, it is necessary to heat the milk for twenty minutes at 149° F. or for five minutes at 176° F. It is important that pails or other utensils used in carrying the unpasteurized milk should not be used, unless previously sterilized, for storing the milk after it is pasteurized.

When diseased animals are found, the stables from which they are taken should be thoroughly cleansed and disinfected. To accomplish this, all litter should be removed; floors, walls

and ceilings carefully swept and the floors together with mangers and gutters, thoroughly scrubbed with soap and water. Thorough cleaning before the application of the disinfectant, cannot be too strongly emphasized. After cleansing, the disinfectant should be applied. A five per cent. (5%) solution of carbolic acid, a 1-1,000 solution of corrosive sublimate or a four per cent. (4%) solution of sulphuric acid may be used.

When the stable can be tightly closed, formaldehyde gas properly used is reliable and satisfactory.

If tuberculous cattle have been kept in a small yard the litter should be removed, the surface plowed and the fencing and other fixtures thoroughly cleansed and disinfected.

THIS is the closing paragraph of a two-page closely type-written letter from Dr. E. M. Bronson, secretary of the Indiana Veterinary Association, to the veterinary profession in his state who are not "within the fold" of the state association, and whom he desires to bring into that body, inviting them to the meeting in Indianapolis, January 10 and 11. This is published without the doctor's knowledge, but we trust not with his disapproval. Maybe he isn't a live secretary? And that is the type of men that are to receive the A. V. M. A. next August!

"Bring your Cora, Mayme, Anna, Margaret, or any of those good names that belong to the better half, that fills that hungry vacuum in a good man's soul, and let her see what a good looking lot of men veterinarians are. (Excepting, of course, the one she chose.) Start NOW and make your plans to COME.

When a bit of sunshine hits ye,
After passing of a cloud,
When a fit of laughter gits ye
An' ye'r spine is feelin' proud,
Don't fergit to up and fling it
At a soul that's feelin' blue,
For the minit that ye sling it
It's a boomerang to you.

—*With apologies to Capt. Jack Crawford.*

"Come on, let's 'Fling it' and be 'Boomerangs.' "

THE ETIOLOGY OF INFECTIOUS ABORTION IN LIVE STOCK.*

BY E. S. GOOD, HEAD OF DIVISION OF ANIMAL HUSBANDRY, KENTUCKY AGRICULTURAL EXPERIMENT STATION, LEXINGTON, KENTUCKY.

The speaker does not presume to come before this body of learned men with a great deal of information concerning the important subject of infectious abortion. If I can add a small bit of knowledge to that already known, or confirm work already done, I shall feel highly gratified indeed. I believe I do not exaggerate when I say that contagious abortion causes an annual loss of millions of dollars to the stockmen of America and is a problem that has not received the attention that should have been given it by the scientists of this continent. The importance of this problem was first forcefully called to my attention while visiting the stock farms of England and Scotland in 1904, when I was told by a number of breeders of pure-bred cattle in that country that at some time in their experience as breeders, infectious abortion had visited their herds and caused heavy losses. Epizootic abortion has laid a heavy hand on the breeders of thoroughbred and standard-bred horses in the Blue Grass region of Kentucky, where keeping a large number of mares on the same farm and even in the same field has been a common practice. In seasons past, as high as seventy per cent. of the mares on some of these farms have aborted. For some reason, however, the mares of that section have, on the whole, been quite free from the disease during the past few years. This trouble has not been among the mares only, for it has and is visiting dairy farms in different parts of the state, and I understand that other states are having similar experience, especially among the cows.

*Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

KINDS OF ABORTION.

Williams, in his text on *Veterinary Obstetrics*, divides abortion in domestic animals into three classes:

"1. Sporadic or accidental abortion, in which, owing to the disease of, or accident to, the foetus or mother, the foetus may be expelled or in a state of disease which renders it impossible for it to live.

"2. Enzootic abortion, due to some infectious disease of the mother, which brings about the death and expulsion of the foetus, as a complication of the maternal disease.

"3. Infectious abortion, an infection of the foetus and its membranes which causes the death and expulsion of the foetus or its expulsion in a living and enfeebled state at any period of gestation from the date of conception to the normal completion of pregnancy, without directly inducing material evidence of the disease in the mother."

It is to this latter class of abortion that I am to confine my remarks. Infectious abortion has been known to exist among stock since the Middle Ages. The cause was then speculative, and the same is true to-day with a majority of the people. A large number of horsemen of the Blue Grass region believe this trouble is due to mares eating frostbitten grass early in the spring; the flushing of the system by eating too much succulent food; some declare it due to the malodor—*i. e.*, if a mare aborts in a field and the foetus and afterbirth are not removed at once and the place on the ground from which they were taken covered with dirt, the odor will of itself cause the remainder of the mares in the field to abort. Others claim that the cause is due to running horses on the same pastures year after year, while some breeders are quite positive that the trouble is the infection of mother and foetus with some micro-organism. The belief is on the whole more common among owners of herds of cattle than of studs of horses, that the disease is due to a microbe, and thereby of an infectious nature.

Although infectious abortion has been known among stock for a long time, there has been considerable variance in the dis-

coveries of different investigators as to the organisms producing this transmissible disease. It might be well at this time to give a brief review of some of the findings of a few of the most prominent investigators in this field during the last thirty years.

Franck, Brauer, Galtier, Nocard, and other workers produced abortion experimentally in cows by inoculating some of the afterbirth of an aborting cow into the vagina of pregnant cows, or by feeding the material to them.

In 1886, Nocard carried out the first extensive investigation of a bacteriological nature with reference to this disease. He recognized a short bacillus and a micrococcus as being most often associated with the foetal membranes of an aborting animal. He was unable, however, to produce abortion experimentally with pure cultures of these organisms.

Ostertag, of Germany, has been one of the most prominent foreign workers of this disease among mares. He found in the heart blood of the foetus, in the thoracic cavity, and in the intestinal tract, short streptococci which usually grew in pairs and readily stained by Gram's method. He also secured this germ from the foetal membranes. He was able to produce abortion experimentally by injecting a culture of this germ into the jugular vein of mares. Considering the fact that Ostertag was able to secure this organism from the foetus and produce abortion experimentally leads me to believe that he secured the germ that was causing the disease among the mares of his special district at least.

Law and Moore, of Cornell, and Chester, of Delaware, have been prominent investigators who have given publicity to their results in this country. These gentlemen have found a type of the colon bacillus in the liquid taken from the uterus and in the foetal and maternal cotyledons.

In 1887, Bang and Stribolt, of the Royal Veterinary College of Copenhagen, Denmark, announced that they had discovered a germ associated with infectious abortion in cows that was able to produce the disease when inoculated intravaginally or intravenously into pregnant cows. As far as I know, these gentlemen

went at the problem in a different manner than any previous investigator, in that they slaughtered a cow showing symptoms of aborting and removed the unopened uterus to the laboratory, where it was opened as aseptically as possible. An abundant grayish yellow, odorless exudate was found between the ovum and the inner wall of the uterus. Upon standing, this exudate separated into two layers, a reddish yellow serum above and a grayish yellow, partly solid layer below. Preparation of this exudate stained with methylene blue revealed numerous very small organisms that resembled, under low power of the microscope, cocci, but on examining them under a higher power they found that they were short, thick bacilli containing one, two and three granules. After a great deal of effort these gentlemen were able to cultivate this organism on serum-gelatin agar, the germ developing in a particular zone of the media, beginning about 5 mm. beneath the surface of the medium and extending downward 10 to 15 mm. They concluded that this bacillus was neither an aerobe nor an anaerobe in the ordinary sense. Their inoculation experiments were affirmative.

The speaker began his bacteriological investigation of infectious abortion in live stock at the Kentucky Agricultural Experiment Station in 1907. The intention at first was to work mainly with the disease in mares, but I learned from experience on account of a definite breeding season that mares usually abort during January, February, March and April. Of course, they abort at other times of the year, and at times soon after conception, but this is the exception and not the rule. Finding that the investigation of this disease with the mare was limited to a few months of the year, we began a study of the cow as well. Cows on dairy farms are bred at different times of the year, and as a consequence, abortions are liable to occur in any month. We at once turned our attention to the isolation of the bacillus discovered by Bang and Stribolt, but during the first three years of our investigations we were unable to isolate it, and came to the conclusion that if it existed in this country it was not causing the trouble with the herds we were examining.

On October 18, 1907, Dr. A. D. Piatt, then of Lexington, Ky., brought the foetus of an aborting mare to the laboratory. This mare aborted twins; the first foetus was passed in the forenoon, the last one about 2.30 in the afternoon. The veterinarian was on the ground half an hour after the last foetus came. He removed the afterbirth as aseptically as he could and brought it, together with the foetus, to the laboratory. The foetus was covered with the amnion, which was pink in color and closely invested the foetus. Distributed rather thickly over this membrane were seen small, yellowish, gritty nodules about the size of a pea. On staining the contents of one of the nodules it was seen to be packed full of a small diplococcus. Here was a case that in all probability could not have become contaminated with outside bacteria, so far at least as the small nodules were concerned. Cultures were grown on serum-agar. On November 13, 1907, this veterinarian brought the afterbirth of an aborting cow to the laboratory. This cow had carried her calf about five months. The placenta was quite badly congested but showed no evidence of decomposition. It was also covered with little whitish nodules, ranging in size from a No. 6 shot to a small pea. Some were nearly round, while others were irregular in shape. Upon staining these nodules they were found to be packed with a small diplococcus measuring about three-fourths of a micron and having the same morphology as that obtained from the covering of the foetus and placenta of the mare. In some respects this organism resembled a very short bacillus in pairs, and it stained by the Gram method. This organism grew aerobically in serum-agar, although it increased in size from the original culture. Two of the large nodules were macerated in 4 c.c. sterile water, and 2 c.c. of the dilution inoculated intravaginally into one pregnant guinea pig, and 3 c.c. inoculated intraperitoneally into another pregnant guinea pig. Four days afterwards the pig receiving the inoculation intravaginally gave birth to three dead pigs, while the other sow carried her pigs full time and delivered them alive. While cleaning the refrigerator, test tubes containing cultures of this organism were acci-

dentally thrown away. The loss was not considered great at the time, as I thought we would soon be able to secure similar cultures from future abortions, but from that time to this we have not discovered a germ connected with abortion corresponding exactly with the one just described.

In one instance we found the foetal membranes and amniotic fluid of an aborting cow teeming with the *Staphylococcus pyogenes aureus* in pure culture. Although skillful medical attention was given to this cow she became weaker and weaker, and when it became evident that she would die, she was slaughtered and posted. Her uterus was a mass of pus, as was the case with numerous internal organs of her body, the *Staphylococcus pyogenes aureus* being the invader. It is evident that this organism invaded the uterus and caused the expulsion of the foetus and afterwards became generalized and would have killed the cow. I speak of these cases to show that other bacteria than those specially noted in literature as causing epizootic abortion may at times infect the uterus, causing the death of the foetus.

During the summer and fall of 1910 and early winter of 1911, we often found a diplococcus in the afterbirth of the cow and umbilical cord of the aborted foetus. It was while bending every effort to secure the afterbirth of an aborting cow as aseptically as possible, endeavoring to determine whether the diplococcus was the only organism connected with the foetal membranes and which resembled morphologically the germ isolated from the mare and cow in 1907, that we obtained a culture of the "Abortus-bacillus" discovered by Bang and Stribolt of Copenhagen, Denmark, in 1887. By exuding a purulent yellowish mass from the vagina, together with a swollen vulva and increased milk flow (was being milked at the time), the cow was marked as one that would abort. When the cow aborted everything was in readiness. She was taken to the open field for the removal of the afterbirth, and as the ground was moist there was no dust flying to contaminate the material as it was taken from the cow and placed in sterile jars. The cow was washed with a disinfectant from the hook points backward.

The veterinarian washed his hands thoroughly with soap and water, cleaned his finger nails, then washed his hands in 1 to 500 bichloride of mercury. The first material taken from the cow was discarded. Three or four cotyledons were placed in sterile jars. Large pieces of compact pus were also taken from this cow and put in separate sterile jars. Streaks of these different parts were made on serum-agar, as is customary in streak dilutions. These Petri dishes were put in a partial vacuum by extracting a part of the air with a vacuum pump. It had previously been determined that this Novy jar slowly leaked air. For instance, if the vacuum measured 27 inches of mercury at the beginning, it would measure from 3 to 5 inches at the end of six days. My intention was that if the Bang bacillus was present in any plating, that it would in this wide range of diminished atmospheric pressure find a definite pressure of oxygen in which it would grow. These plates were incubated for six days. As was shown by controls, some of the serum used was contaminated. One plate which had been streaked with a cotyledon had two organisms growing upon it, one the diplococcus in question, growing on limited areas, the other the "Abortus-bacillus" Bang, growing scantily on a considerable part of the plate. The contaminated serum was a blessing in disguise in that the multiplication of the germs it contained aided in reducing the oxygen in the jar to just the pressure needed to secure some growth of the bacillus mentioned. I have since grown this bacillus by the same procedure, though the method is not practicable.

Learning that MacNeal and Kerr, of the Illinois Experiment Station, had succeeded in isolating the "Abortus-bacillus" Bang, I went to that institution to compare cultures and found them to be identical. Dr. MacNeal used the Nowak method of plating in obtaining his cultures. The method consists in lowering the pressure of oxygen necessary for the "Abortus-bacillus" to grow by means of *Bacillus subtilis*, allowing one square centimeter of surface culture of the subtilis to each fifteen cubic centimeters capacity of the jar in which it is grown. We find

that the Novy jar for growing anaerobes is admirably adapted for this work. I might say that Nowak has furnished by this method the only practicable plate method of isolating the germ from the afterbirth where it is contaminated. The method is, in short, to streak a piece of cotyledon or other part of the afterbirth over two or three Petri dishes in succession as is ordinarily done in streak dilutions. The plates are then incubated at 37° C. for twenty-four hours in the air. At the end of this time, if the streaks have been successfully made, there will be some clear places on the plate. These clear places are marked with a wax pencil or ink. The plates are then incubated for three days, as mentioned above, at the end of which time the transparent colonies of the "Abortus-bacillus" Bang may have appeared in the clear places on the plate. I find that plain 2 per cent. agar is a very good medium on which to grow this germ if correctly standardized for this germ. We standardize it neutral (faint pink) to phenolphthalein.

On March 25, 1911, a heifer that had previously aborted in the herd from which we had obtained the *Bacillus abortus* was giving every symptom of aborting. She was confined by herself and during the night aborted an eight-months-old foetus. This calf was too weak to stand and died the next morning. Cultures were made from the liver, stomach and intestinal contents of the calf. Although we tried to observe aseptic precautions, three different germs were obtained in our plating, one of which, however, as far as morphology was concerned, was identical with the "Abortus-bacillus" Bang. In the meantime, our attention was called to an aborting herd of cows some miles from Lexington. I immediately visited this farm and found up to that time eighteen cows out of forty had aborted during the year. The manager of this herd had had abortion in his own herd at one time and for two years lost nearly every calf, and consequently recognized this type as an infectious type of abortion. We have examined four afterbirths since that time from aborting cows in this herd and have obtained pure cultures of the "Abortus-bacillus" Bang in two cases and in mixed culture in one case. We also killed and posted a calf two weeks

of age in this herd that was aborted at eight months and lived, though very weak. Platings were made of the liver, stomach and intestinal contents. The results were negative.

On July 9 I was notified that a heifer of the first-named herd had aborted. She had been bred on the first of January. While this cow was being milked, the milker noticed that she maneuvered as if she wanted to lie down. As soon as the milking was completed this cow aborted a male foetus. I at once thoroughly scalded a pail, and after washing the foetus with hot water, put it in the pail and took it to the laboratory. I meant to take every precaution this time to prevent outside contamination, so washed the foetus with 95 per cent. alcohol and opened it up under aseptic conditions. We found all the internal organs apparently normal with the exception of the peritoneum, kidneys and one lobe of the liver. The kidneys appeared enlarged and were highly congested, being nearly black in color. Each kidney measured two by two and one-half inches. The parietal peritoneum showed local areas of congestion. The quadrate lobe of the liver was very much inflamed. The kidneys, liver, small intestine, stomach and umbilical cord (at entrance to foetus) were seared and opened with a sterile lance. One or two small loopfuls of material were taken from each organ and streaked on numerous plates. Nothing but colonies of the "Abortus-bacillus" Bang were obtained in any dish with the exception of the plating of the umbilical cord, which was highly contaminated. There were, however, a few clear places on one plate of the umbilicus on which could be seen colonies of the bacillus. The colonies of "Abortus-bacillus" on most of the plates were so numerous as to be confluent. Taking into consideration the small amount of material plated, and the abundant growth secured, it was evident that this bacillus must have been exceedingly numerous in these organs. The bacillus was also identified in the different organs by stains.

The afterbirth of foetal membranes were removed the next morning by Dr. Graham, and he reported her uterus to be extremely sensitive, showing typical symptoms of metritis. Platings

were made of the cotyledons and injection of bits of cotyledons were administered subcutaneously into a pregnant guinea pig. The pig died over night and upon being posted was found to be infected with the colon bacillus. She had, however, aborted one pig before dying. The plating from the cow revealed the colon bacillus on most of the plates, and on only one plate, and that on a small area, did I find colonies of the Bang bacillus. Though this cow was given every attention, receiving daily vaginal douches, she exhibited on the ninth day after calving symptoms of septicæmia, and on the 23d of July, two weeks after calving, died. Dr. Graham posted the cow and pronounced her death due to metro-peritonitis.

We have not, as yet, tried our culture on pregnant cows. So far we have inoculated five pregnant guinea pigs subcutaneously with pure culture of this organism. Four of these pigs aborted. Two of the pigs inoculated with one culture gave premature birth to dead pigs after an interval of eight to eleven days respectively from the date of inoculation. One delivered pigs at full time. Two pigs inoculated subcutaneously with a pure culture obtained from another aborting cow went thirteen to twenty-one days respectively before aborting. I thought they would surely deliver their pigs at full time. The uterus of both of the pigs showed abscesses at their placental attachments. The covering of abscess was somewhat tough—cartilaginous. The sow that went twenty-one days passed four foeti, two of which were apparently fully developed. The other two possessed no hair and were considerably shrunken; in fact they were partly mummified and evidently had been dead for several days before expulsion. Streaks of cross sections of these abscesses of the uterus of the mother pig on plain agar looked, after being inoculated, as if one had smeared the plates with a pure culture of the bacillus, so plentiful was the growth. We also obtained cultures of the "Abortus-bacillus" from the pus at seat of inoculation in each case from the cotyledons of each pig, and from an ovary in one case. We have never been able to secure the bacillus from the foetuses, nor from the liver or heart blood of the mothers. Mac-Neal did secure cultures from the foetuses of guinea pigs in

several instances and from the heart blood of the mother in one instance.

On June 28 we inoculated the growth on three agar-serum tubes, diluted in 20 c.c. of bouillon, in the ear vein of a pregnant sow weighing two hundred and twenty pounds. On July 8 this operation was repeated by injecting into her ear vein the growth on twelve inclined tubes of agar diluted in physiological salt solution. Seventy-five cubic centimeters of this material were injected at this time. There was no reaction to speak of with the exception that the sow refused to eat for two days. On July 31 it was noticed that the sow was in heat. It is not certain that this sow was pregnant, as she was purchased, though she gave every evidence of being well along with pig when inoculated. On August 7 this sow was slaughtered and platings made of the uterus, ovaries, kidney and liver. The results were negative.

Dr. Bang was able to produce abortion in cows by intravaginal injections of pure cultures of this bacillus, the incubation period being from seventy to eighty days after the first inoculation. He was able to produce the disease in a mare by introducing intravenously a pure culture of the germ. Incubation period was twenty-eight days. MacFadyean and Stockman, of Great Britain were able to produce the disease in eight cows with the intravenous injection of the virus and pure culture. They were also able to produce the disease by feeding in three out of four cases.

The *Bacillus abortus* has now been isolated by Bang and Stribolt, of Denmark; Preiz, of Hungary; Nowak, of Austria; MacFadyean and Stockman, of Great Britain; by Zwick, of Holland; MacNeal and Kerr, of Illinois Experiment Station, and by the writer, of the Kentucky Experiment Station. Considering the different countries in which this peculiar germ has been found associated with infectious abortion, it looks quite conclusive that it is the cause of some of the outbreaks of the disease among cows, if not the universal cause.

Up to the present time we have no definite results of our own to give relative to the etiology of infectious abortion in

mares. As I said in my introduction, the disease has not been so prevalent among mares in our section of the country during the past three years as was formerly the case, hence we have found it somewhat difficult to get specimens.

Dr. Surface of the department was able to secure a bacillus from a stud of aborting mares this spring (where something like twenty-five out of forty mares aborted), which, when inoculated subcutaneously into a pregnant guinea pig, would cause it to abort. He was able afterwards to secure the germ from the uterus and placenta of the pig. The incubation period was about the same as for the "Abortus-bacillus" Bang. Dr. Surface is now abroad on a leave of absence studying the disease from the standpoint of the European.

I investigated an outbreak of the disease in a small stud of jennets early this summer. There were five jennets at this place and every one aborted. A short bacillus was obtained in pure culture from the heart, liver, spleen, stomach, intestines, kidneys, uterus, ovaries and the lymphatic system of a nearly developed foetus (female) of one of these jennets. This foetus was taken to the laboratory as soon as it was dropped—in fact the veterinary surgeon aided in its delivery. I have not as yet completed a thorough physiological study of this organism nor have any inoculation experiments been conducted on any animal with this germ.

In studying the cases of both of these studs our technic was the same as used in isolating the "Abortus-bacillus" Bang, but in no instance did we find that organism. We are in no position at the present time to say that either of the bacilli isolated from the mares or jennets is the cause of the disease among horses in our region.

There is no germ that I know of which at the present time is accepted to be the universal cause of the disease among mares.

I wish to acknowledge valuable aid received from time to time in these investigations from Prof. T. R. Bryant and Dr. Robert Graham, both of the Department of Animal Husbandry of the Station.

HOG CHOLERA.

V. B. VACCINATION (*Virulent Blood*).

BY M. H. REYNOLDS (1), EXPERIMENT STATION, UNIVERSITY OF MINNESOTA.

A preliminary report of this work was published as a claim for priority in the AMERICAN VETERINARY REVIEW for November, 1910. The principles involved in this, rest on the discovery that very young pigs from sows that have undergone the processes of active immunity are, as a rule, highly resistant to cholera and that this is rapidly lost as the pigs grow older.

It has been well known in a general way that hogs from previously immune dams have varying degrees of natural immunity and that most of them will die under exposure or inoculation, although perhaps showing some resistance.

So far as the writer knows, it has not been previously shown:

1. that *very young* pigs from immune sows are, as a rule, highly immune;
2. that this is gradually lost in most cases; and
3. that this temporary immunity can be made comparatively permanent by inoculation with simple, unmitigated virus if given during this early immune period. It is obvious that this may be done at an insignificant cost.

We find that after about five weeks of age this inherited immunity cannot be relied on, although some pigs retain immunity sufficient to resist direct inoculation until 12 or 14 weeks old.

In our first preliminary report, we were unable to give any information as to whether sows immunized by Dorset-Niles serum-virus method would produce highly immune pigs. During the present year we have accumulated some data on this subject, a summary of which will be given here.

At the time of our earlier report we had insufficient data upon which to base statement whether young sow pigs receiving V. B. Vaccination, would themselves produce pigs of sufficient immunity for this process. We now offer some data to cover this point, which is particularly gratifying.

Experiments with young pigs from susceptible sows have been limited but indicate that they have no unusual resistance on account of age, but are very susceptible.

We keep our virus at the highest possible grade for our Dorset-Niles serum work by continually passing through light shotes. Such virus has been purposely used in our V. B. Vaccine work. It is reasonable to suppose that if virus of lower grade, easily produced, had been used, our percentage of losses under V. B. Vaccination might have been still smaller. One-half a cubic centimeter, the dose which these young pigs received, is a very large dose of high virulence serum for such small and young pigs. In several instances litters have been injected with 5 c.c. of this virus at from 5 to 7 days old, without harm. Smaller dose or less virulence may give permanent immunity, with still less risk and loss.

Everyone familiar with the raising of young pigs knows that an important proportion of young pigs die under any conditions of feed and care. A portion of the young pigs reported here as dead were examined post-mortem. Conditions in other cases were such that a careful post-mortem was impossible. It was not practical for us to attempt inoculation of susceptible pigs from each V. B. pig that died. Some of the cases examined post-mortem were evidently cholera.

The reader will kindly remember that blood of the highest virulence was used on these little pigs in this preliminary work. Blood of very much lower virulence will probably produce all needed and permanent immunity and will probably be used in practical field work. Bear in mind also that our exposure immune sows were taken more or less at random as to their periods since infection.

EARLY WORK—UP TO JANUARY 1, 1911.

The reader is asked again to bear in mind, while considering the following data, the high general mortality risk with very young suckling pigs and their small value when lost as compared with the older hogs usually immunized by other methods.

Brief mention of our earlier work appeared in the AMERICAN VETERINARY REVIEW, Vol. XXXVIII, No. 2. This is included here in the following later statement.

Up to January 1, 1911, we gave V. B. Vaccination to 107 pigs 6 weeks old and under, from 25 exposure immune dams and V. B. immune dams, with a total loss of 8 pigs from pigs from probable vaccination cholera (2).

Exposure immune dams.—Eighty-nine pigs from about 22 exposure immune dams were inoculated with .5 c.c. virus with a loss of 8 pigs (3), which may be reasonably charged to the vaccination.

During 1910 we studied the immunity held by young pigs of greater age. In this work we inoculated 16 pigs from 5 exposure immune sows. These pigs covered in age 7 to 14 weeks. There died 9, mostly plain cases of cholera. This, as well as later experience, indicates that V. B. Vaccination should not be used for pigs over 5 weeks old.

V. B. Vaccine sows.—This means sows that had been given treatment by our method when little pigs the year before. During this same period eighteen pigs under six weeks old from 3 such sows were inoculated with no losses.

From Exposure Immune Dams.

Age, Days.	Number of Pigs.	Dose of Virus.	Results.
5	7	.5 cc.	No losses (4).
9	14	.5 cc.	2 died; pneumonia.
12	3	1.5 cc.	1 died, probably cholera.
14	4	.5 cc.	No losses.
21	9	.5 cc.	2 died; probably cholera.
28	45	.5 cc.	5 died; probably cholera.
35	3	.5 cc.	1 died; cholera.

From Exposure Immune Dams—Continued.

Age. Days.	Number of Pigs.	Dose of Virus.	Results.
42	4	.5 cc.	No deaths.
45	4	.5 cc.	2 died; one developed chronic cholera; stunted in growth; finally recovered.
56	3	.5 cc.	2 developed chronic cholera; finally recovered.
72	6 (4 weaned; 2 unweaned)	.5 cc.	2 weaned and 2 unweaned died of chronic cholera. The remaining two weaned pigs were very unthrifty.
84	2 (1 weaned; 1 unweaned)	.5 cc.	Both died after several weeks; chronic cholera.
98	1	.5 cc.	Chronic cholera; died after three weeks.

From V. B. Immune Dams.

Age, Days.	Number of Pigs.	Dose of Virus.	Results.
14	11	.5 cc.	None sick.
21	7	.5 cc.	None sick.

Death Rate by Weeks of Age. Pigs From Supposedly Immune Dams of Both Classes Combined.

Age, Weeks.	Number of Pigs.	Results.
Under 1 week	7	No losses.
1 to 2	32	1 died; probable cholera (5).
2 to 3	16	2 died; cholera.
3 to 4	45	5 died; cholera.
4 to 5	3	1 died; cholera.
5 to 6	4	None died.
6 to 7	4	All sick; 2 died.
7 to 8	3	2 sick; none died.
8 to 9	6	4 died.
11 to 12	2	Both died.
13 to 14	1	Died.

Summary.—So far our results have been quite satisfactory with pigs under 5 weeks of age. Apparently the younger the better, down to 1 or 2 weeks.

An early temperature reaction with pigs given V. B. has thus far seemed to indicate good results. Retarded temperature reaction seems to indicate a tendency to develop chronic cholera.

DATA, 1911 (6).

During 1911 we gave V. B. Vaccination to 183 pigs *four weeks old and under*, from 31 sows of all three classes, and lost 15 pigs all from two litters; nine from one sow; six from the other, in each case, the entire litter (7). See explanatory note concerning "Old Yellow Sow." Twenty-nine of thirty-one sows produced pigs all of which took V. B. Vaccination perfectly.

Our 1911 work is grouped as follows:

Exposure immune sows.—During the year of 1911 we vaccinated 30 pigs from five exposure immune sows and lost nine. Please note that all of these nine were from the one *old sow* ("Old Yellow Sow") subsequently mentioned and explained. With this one litter excluded, there would be no losses for pigs from exposure-immune sows.

V. B. Vaccination sows.—From nine V. B. sows forty-three pigs were inoculated with *no* deaths. Note there were no losses in either 1910 or 1911 and none up to date, among pigs from sows immunized by our V. B. method.

Dorset-Niles sows.—From seventeen sows made immune the year before by the Dorset-Niles serum-virus method we inoculated 110 pigs and lost six, of which five were from one sow and had a doubtful diagnosis. These five pigs included as having died under V. B. Vaccination, were in yards of a certain city garbage feeder. Autopsy gave a questionable diagnosis of cholera. Soon after the same owner had other young nursing pigs from immune sows, sick in a very similar way—pigs that had not received vaccination, and being from immune sows, were too young to contract cholera by exposure even if the V. B. pigs previously sick had had cholera.

There is grave doubt therefore, in this and other cases, as to whether the little pigs died from cholera as result of V. B. Vaccination. Pigs that died from *known* causes other than cholera

have been excluded. *All reasonably doubtful cases have been included, however, as deaths from cholera and charged to V. B. Vaccination.*

The showing for pigs from V. B. sows is particularly gratifying and indicates that hogs receiving this V. B. Vaccination are very highly immune at the end of a year as compared with sows immunized by other processes. This is estimated by the degree of immunity possessed by their pigs at birth, which we now believe to be a very reliable index as to the relative immunity of the dams. This is illustrated by a case previously mentioned.

In one case we had it occur that a sow produced pigs that were sufficiently susceptible to die under six weeks of age from V. B. inoculation. The sow's immunity was then reinforced by inoculation with virus. She became ill and was off feed for some days but recovered, showing rather low immunity. Her next litter proved highly immune under V. B. Vaccination.

In another case we had an old exposure immune sow ("Old Yellow Sow") which produced two successive litters of pigs which stood V. B. Vaccination perfectly. A third litter was vaccinated by this method and all nine pigs died. The old sow's immunity was then reinforced and the next litter all stood V. B. Vaccination perfectly. This seems to indicate that old hogs that have been at one time highly immune, may be slowly losing immunity, as we would reasonably expect.

We have given some study to the question as to whether the little pigs' immunity was due to inherited immunity or whether it was receiving protection from the mother's milk. In this we had some interesting experiences which will be reported later. Our work along this line shows as far as it has gone that nursing has little to do with the pig's immunity.

In the course of this work we have had various interesting side experiments, *e. g.*, sow 202 weighing about 45 pounds, was treated with a large dose (115 c.c. serum) from little pigs 1½ days old, from an immune sow. At the same time she received 2 c.c. of highly virulent virus. Sow 202 was one of a carefully

selected lot of pigs purchased for our regular serum testing and was presumably susceptible. She remained in perfect health. Her vaccination was given on August 12, 1910. On July 15, 1911, we inoculated six pigs four weeks old, from this sow, with $\frac{1}{2}$ c.c. of highly virulent serum, with the result that the pigs all took this V. B. Vaccination perfectly, showing not only a high degree of immunity for themselves but also a high degree of immunity for the dam.

We are not putting our V. B. Vaccination before the profession as something settled. We are not yet advising general use even where exposure immune or serum-simultaneous immune sows are plentiful as they will be in many sections of the corn belt next spring.

Future experience may show that immunity conferred by this method upon very young pigs may not be uniformly as permanent as our results up to date would seem to indicate. In that case it may only be necessary to revaccinate by this simple and inexpensive method when the pigs reach some, as yet undetermined, age which must, of course, be within the immune period.

This method has not yet made good in general field trials with different strains of hogs under different climatic conditions and different systems of feeding. All that we are doing so far is reporting frankly our results in preliminary trials and saying that we are hopeful.

Possible field of usefulness.—Our idea of this may be shown in a suggestion to the effect that there will be many places throughout the corn belt next season where exposure immune sows will be plentiful. If actual field trial on large scale in many sections confirms the work of two years and a half as here reported, then owners of such sows can immunize little pigs next spring and their descendants in turn generation after generation, at an expense that will be insignificant. The cost of $\frac{1}{2}$ c.c. of virulent serum is practically nothing.

We can hardly expect that the general run of farmers owning a few immune sows will take the pains to continue their stock immune to cholera even if it could be done at such insig-

nificant expense. On the other hand, intelligent farmers who carry a heavy investment in hogs, and breeds of valuable pure breeds, could continue their stock immune at a trifling expense. It seems probable that such men would do so if the virus and veterinarians to use it were available.

If future experience confirms our expectations, then V. B. Vaccination may play a helpful part in the future control and eradication of hog cholera.

Our work in the past nearly three years has progressed to such an extent that we now feel justified in beginning more extensive field trials and are planning to do so at several points in the state during the coming year.

Field trials.—The writer would like to correspond with a few veterinarians who have something of an experimental turn of mind and who are located in sections where cholera has prevailed during the present season. We should like to arrange for field trials of V. B. Vaccination under as different conditions as possible.

1. Attention is called again, as in our preliminary report (see AMERICAN VETERINARY REVIEW of November, 1910), to the fact that the original discovery of the underlying principle should be credited to the writer.

Reynolds and Beach planned the later experiments together. To Dr. B. A. Beach belongs the credit for carrying out the later experiments as planned, for the keeping of records, and for original suggestions concerning the conduct of the work and interpretation of results.

2. This does not include one little runt, which died, cause unknown, and which should not have been included in the experiment. It does not include two pigs which died, with a diagnosis of probable pneumonia other than hog cholera, or one pig which died after receiving 1.5 c.c. virulent serum; *i. e.*, three times the standard dose of .5 c.c.

3. Not counting one entire litter of seven pigs from a sow of uncertain history.
4. One weakling died during the experiment which should not be counted.
5. Received 1.5 c.c. virus, three times the usual dose.
6. An experiment station bulletin is being prepared for early publication. This will give methods, work done and experimental data in full.

7. One of these 15 pigs may have belonged to a third dam. We could not be absolutely certain.

THE INDIANA VETERINARY ASSOCIATION will meet at the Hotel Denison, Indianapolis, January 10 and 11, and a large attendance is anticipated.

EXPERIMENTS IN ERADICATING TUBERCULOSIS FROM A HERD.*

BY PROF. NELSON S. MAYO, M.S., D.V.S., VIRGINIA POLYTECHNIC INSTITUTE,
BLACKSBURG, VA.

There is no doubt but that bovine tuberculosis is one of the most serious and at the same time one of the most difficult diseases that live-stock sanitary authorities have to deal with. Because of the slow, insidious character it is difficult to impress upon the public the seriousness of the disease, and without a public sentiment to support them it is almost impossible for state or local sanitary officials to make any progress, as those of you who have tried, even with the best of measures, can testify. Up to the present time the hypodermic injection of tuberculin has been the only method that has given any results in the control or eradication of tuberculosis. With the use of tuberculin there has developed two factions, one of which claims vigorously that tuberculin is of no value but actually a serious source of danger when injected into healthy or tuberculous animals. The other faction holds that tuberculin is the only satisfactory means of detecting bovine tuberculosis that there is no danger in its use; that it is practically infallible; and that it is a simple matter to eradicate tuberculosis from a herd by using tuberculin once or twice. Such seems to be the general situation to-day. It is unfortunate in many respects because bias or prejudice seriously hinders the accumulation of actual facts regarding the use of tuberculin.

During the past twenty-two years the writer has been connected with four different agricultural colleges, in each of which efforts have been made to eradicate tuberculosis from the herd. The difficulties encountered have been greater than was anticipated.

* Presented to the United States Live Stock Sanitary Association, Chicago, December, Jan. 10-11, 1912.

pated, and in some instances, after two or three tests with elimination of reactors and disinfection, when we were laboring under the impression that tuberculosis was eradicated from the herd, we were chagrined and disappointed to have a serious outbreak without apparent cause. I think that we who advocate the use of tuberculin in eradicating tuberculosis err in conveying to the cattle owner the impression that it is a comparatively easy task to free a seriously infected herd from this disease. We must be exceedingly cautious about declaring a herd free when we get no reactions. The following brief history of tuberculosis in the herd of the Virginia Polytechnic Institute, while possibly not typical, is not greatly different from other seriously infected herds, where a persistent and conscientious endeavor has been made to eradicate tuberculosis.

The herd of cattle at the Virginia Polytechnic Institute was composed largely of pure-bred cattle of the leading beef and dairy breeds, comprising Shorthorns, Herefords, Aberdeen-Angus, Holsteins, Jerseys, Guernseys, and some grades. The Polytechnic Institute is located on the crest of the Allegheny Mountains, 2,200 feet above sea level, in a fine blue grass region, where the winters are comparatively mild and the summers pleasant. The herd has been kept under better sanitary conditions than the average herd.

Previous to 1901 the college herd was housed in the old farm barns of the Solitude Plantation owned by the V. P. I., but in 1901 new, commodious, well-lighted and ventilated barns were built in another location and the herd transferred to them. The herd has been confined in stables but little. During the winter the cattle are stabled nights and during inclement weather, spending the days in yards about the barns. In the summer the dairy cows only are placed in the stables for feeding and milking twice daily. The beef cattle and those not giving milk are in pasture all summer.

The herd was first tested with tuberculin by Dr. E. P. Niles, veterinarian, Virginia Experiment Station, in 1893. Fifty-four animals were tested. One reacted and was killed. Two were

considered suspicious and were retested two weeks later, did not react, and were left with the herd.

A "scrub" milch cow purchased after this test and kept with the college cattle died from acute tuberculosis the next spring. The herd was retested with tuberculin in June, 1894, with six reactions. The reacting animals were separated and retested one month later and only one reacted. Another soon showed physical symptoms and three of the reactors were destroyed. The other three were isolated and were probably retested and reactors destroyed the following fall. In a recent letter Dr. Niles says: "Following these tests all purchased stock was tested before being added to the herd, and in subsequent tests no reactions were obtained with the exception of a Holstein bull which was purchased on a local veterinarian's certificate and which reacted to my test and was killed, confirming my diagnosis on post-mortem examination. I had made no tests for a few years before leaving the station."

Dr. Niles severed his connection with the college in 1902 and for two or three years the herd was not tested. In 1905 Dr. John Spencer began testing the herd. Some of the reacting animals were slaughtered, others were placed by themselves in a row of stanchions in the stable but not otherwise separated from the herd. After the test of January 21-23, 1908, when 30½ per cent. of the herd reacted, it was decided to ask the assistance of the Bureau of Animal Industry of the United States Department of Agriculture and make a thorough and systematic effort to free the herd from tuberculosis. The herd was treated as if there had been no previous tests and 22 per cent. reacted to the test in June, 1909. All reacting animals were at once removed from the non-reacting, placed in other quarters half a mile away, and kept entirely separate. At the next test, made in April, 1909, nearly 35 per cent. of the healthy herd reacted. It should be stated that the barns and yards had not been disinfected since the previous test. After this test the stables and yards were thoroughly cleaned and disinfected, as they have been since whenever a reacting animal was found. A summary of these tests will be found in the following table:

CHART A.

NAME OF PERSON MAKING TEST.	DATE OF TEST.	Number of Animals Tested.	Number of Reacting Animals.	Number of Suspicious Animals.	Per cent. of Reacting Animals.	Number of New Cases Reacting.	Number of Previously Reacting Cases Retested.	Number of Reacting Animals Disposed of Since Last Test.	Number of Reacting Animals Disposed of Since Last Test.
Dr. Spencer	March 21-23, 1905.	115	21	..	18.3	21	..	..	..
Dr. Spencer	April 26-27, 1905...	22	9	..	40.9	1	19	9	11
Dr. Spencer	April 3-6, 1906....	111	26	1d.	24.3	14	14	12	2
Dr. Spencer	June, 1906.....	27	7	2	25.9	..	23	7	16
Dr. Spencer	May, 1907.....	94	22	1	23.4	15	15	7	10
Dr. Spencer	Nov. 11-12, 1907..	27	0	..	..	..	3	..	..
Dr. Spencer	Jan. 21-23, 1908...	129	39	..	30.2	29	12	10	2
U. S. Bureau of Animal Industry..	June 9-11, 1908...	113	25	..	22.1	3	36	22	14
U. S. Bureau of Animal Industry..	April 7-8, 1909....	89	31	..	34.8	27	11	4	7
U. S. Bureau of Animal Industry..	Oct. 10-11, 1909...	58	0	..	0	0	6	0	6
U. S. Bureau of Animal Industry..	April 27-28, 1910..	57	4	2e	7.0	3	6	1	5
U. S. Bureau of Animal Industry..	Oct. 11-12, 1910...	52	0	0	0	0	4	0	4
U. S. Bureau of Animal Industry..	April 26-27, 1911...	63	5	0	7.1	5	4	0	0
U. S. Bureau of Animal Industry..	Oct. 25-26, 1911...	57	0	0	0	0	2	0	2

The beef and dairy herds are kept separate and there have been no reactors in the beef herd since April, 1909, although there were two old reacting cows among them until May, 1910, and once since. In the dairy herd there seems to be a "Typhoid Mary" that we cannot locate by tuberculin testing or physical examination.

In testing cattle with tuberculin the test may fail in two ways: first, cattle may react to the test and fail to show evidence of tuberculosis on post-mortem examination. The man opposed to tuberculin testing makes much of such failures. Such errors are few and to me are of practically no importance. In the Virginia Polytechnic Institute herd there were 279 animals that can be identified that were tested with tuberculin once or more since 1905. Of these 116 have reacted, or 41.58 per cent. Of the 116 reactors three have failed to show evidence of tuberculosis on post-mortem examination, or 2.6 per cent. Government statistics, covering a much greater number of animals, gives this error at 2 per cent. Tuberculin tests may also fail in that the animal may not react to the test and still have tuberculosis. Such errors are much more serious than the other class because a tuberculous animal that may be a source of infection is left in the healthy or non-reacting herd. This failure in testing is difficult to locate, and estimate for it is rare that non-reacting animals are available for post-mortem examination. In my opinion this error is more frequent than reactions that fail to show disease.

If we take the first government test of our herd—113 animals were tested—there were probably 11 tuberculous animals that failed to react, or over 9 per cent. I think this per cent. of error is much too high, as four of these reacted to the next test.

It is often claimed that a thorough physical examination of a herd at the time of testing will reveal these non-reactors. While such an examination is very important, there are comparatively few cases that can be thus detected.

We test our herd twice a year, in the fall just before going into the stable for the winter, and in the spring just before turning on grass. During the past three years we have had no re-

actors at the fall test but have had them at the spring test, indicating that they probably contracted the disease in the stables or yards during the winter. I consider frequent and thorough disinfection of stables and yards very important in freeing a herd from tuberculosis, just as important as eliminating an infectious animal. This, I believe, is where we greatly err—in being lax about disinfection of premises.

There are many points in tuberculin testing that we need light upon. We need a definite standard of tuberculin. We need to know more about what constitutes a reaction. We ordinarily say a rise of two degrees. Why not $1\frac{1}{2}$ degrees or even 1 degree? Are there not some conditions that we do not understand that are favorable or unfavorable to getting reactions in a herd? Could we not have a large number of cattle tests with tuberculin just before they are slaughtered in order to determine how many may be tuberculous and not react? Tuberculin testing is not the simple process that many think it to be. It is only by the careful collecting of facts for and against the test that it can ever be put upon a scientific foundation and thus eliminate many of the puzzling problems that confront us at present.

ANNUAL CONFERENCE FOR VETERINARIANS AT ITHACA—
The fourth annual conference for veterinarians will be held at the New York State Veterinary College on January 10 and 11, 1912. All licensed practitioners of the state are most cordially invited to be present at this conference. Dr. Adams, of the University of Pennsylvania, Dr. Richard P. Lyman, of East Lansing, Mich., and Dr. Cassius Way, of Chicago, will be among the speakers. The program will be of a highly practical nature.

MISSOURI VALLEY MEETING—The Missouri Valley Veterinary Association will convene at the Coates House, Kansas City, on January 30, for a three days session. A valuable program of scientific and practical interest is being prepared. The clinical part of the program will include demonstrations and discussions of hog cholera and other diseases, and the intradermal and ophthalmic tuberculin tests. Anyone who can possibly do so, should take advantage of these highly educational features by attending this midwinter meeting.

HOG CHOLERA.

BY F. R. COMBER, B.A., M.D.C., CHIEF ASSISTANT STATE VETERINARIAN,
MADISON, WIS.

Synonyms.—Swine fever, pnèumo-enteritis, pig typhoid, blue disease, purples, red soldier.

The distinguishing features of this disease are a continuous fever, ulceration of the intestines and more or less discoloration of the skin, especially of the ventral surface.

Etiology.—The specific disease known as hog cholera is as some believe caused by *Bacillus cholera suis*, while other authorities hold the germ has not been isolated yet.

Symptoms.—The symptoms of hog cholera are by no means constant. The best informed writers on the subject agree that hog cholera cannot, with certain exceptions, be positively diagnosed from the symptoms. Animals suffering from various intestinal troubles frequently exhibit symptoms which very closely resemble this disease. There are two recognized forms, *i. e.*, acute and the chronic or mild form.

In the acute disease, the animals die very suddenly after a few hours or, at most, a few days' sickness. In the other form the disease runs a longer course. There is usually a rise in temperature of from 1 to 3° F.

The sick animals act dumpish and spiritless, lie quietly in a corner and huddle up together, usually concealing the head in the litter. They refuse to move when disturbed and are more or less oblivious to their offspring. The appetite varies. In acute cases the animals may eat quite heartily up to within a few hours before death. In more chronic forms they eat fairly well until the end. They may or may not have diarrhœa. Frequently the bowels are costive. It is quite common in these cases to have an

active diarrhoea during the last few days. The color of the discharge depends largely on the food. Vomiting rarely occurs. The changes in the respiration and the pulse are hard to determine. There is rarely any cough. Usually there is considerable reddening of the skin on the nose, ears, abdomen and on the side of the thighs and pubic region. The redness is diffuse and becomes more intense as death approaches. In some cases there is a discharge from the eyes. In the chronic form the animal becomes emaciated. These symptoms vary to such an extent that it is sometimes necessary to make post-mortem examination and even the diagnosis must often be delayed until the results of a bacteriological examination has been obtained.

It not infrequently happens that swine suffering from hog cholera are attacked with swine plague, the two diseases co-existing in the same animal.

Differential Diagnosis.—Hog cholera is to be differentiated from a great variety of dietary disorders and poisoning from alkalies and other chemicals which may get into the food. Powdered soap has been found to produce, when given in sufficient quantities, a series of symptoms quite similar to those of hog cholera. In addition to the many as yet etiologically undetermined disorders often producing a high mortality and popularly called hog cholera, infectious pneumonia or swine plague and tuberculosis are to be distinguished.

It sometimes happens that swine when kept under good hygienic conditions suffer from disorders which in their symptoms resemble hog cholera, but anatomically the lesions are varied and irregular. In one instance *Bacillus coli communis* seemed to stand in a causal relation to the trouble.

Recently the writer has studied two similar enzootics in which several animals died and where the lesions were very few and exceedingly varied.

The dietary disorders are determined by their history, the irregularity of the lesions and the failure to find the specific organism of hog cholera in the tissues of the dead animals. An important feature is the fact that the trouble does not extend be-

yond the herd or herds first attacked or animals fed and kept under like condition.

The amount of loss from these troubles is very large. They are often confused with and mistaken for hog cholera.

Prevention.—The bacteria causing hog cholera can be carried in the dirt, on animals, or, as is most usually the case, the pigs may have been but recently infected and, being transferred during the period of incubation, they develop the disease later. It not infrequently happens that the purchased animals are actually suffering from a chronic form of the disease to which they eventually succumb, but meantime infect others.

The bacilli of hog cholera live for a considerable time in water. On this account bacteria from outbreaks which start at or near the source of a creek or small river may be carried in the current and infect animals which wallow in the stream many miles below. By keeping swine in a small inclosure away from infected streams and fields the disease is often prevented.

The bacilli of hog cholera can be carried in the dirt which adheres to one's shoes or to farming utensils. It not infrequently happens that the virus is carried by buzzards, crows and other birds. There is no positive proof that the virus may not be disseminated in many other ways. The hypothesis emphasizes the necessity for promptly disposing of the dead animals instead of leaving them for the prey of scavengers.

If they cannot be burned it is best to cover the bodies with a liberal amount of lime and bury them.

When healthy hogs are separated from those suffering with the disease it is a safe precaution to dip them in a disinfectant to kill any hog cholera bacteria that may be upon the exterior of the body.

Specific Treatment.—A large number of investigations have been made to find a protective vaccine for the disease and also to find a specific serum treatment. Thus far satisfactory experimental results have not been fully obtained. In a number of instances, where the practical application of the serum treatment has been made most satisfactory results in nearly every instance

followed, but the reports fail to give evidence of an accurate diagnosis of the disease treated. In these cases the better management of the animals in addition to the serum would suffice to check the disease if the trouble was of a dietary nature. There is need of additional investigation along these lines and money spent to throw more light on the treatment of this much dreaded disease would be well spent indeed, and it is a cause which merits the cooperation of us all.

DR. P. K. NICHOLS, veterinarian to the New York City Department of Health, in charge of the Borough of Richmond (who is also diagnostician to the New York State Department of Agriculture in that borough), was the official representative to the United States Live Stock Sanitary Association at Chicago, from the New York City Board of Health.

THE MINNESOTA MEETING—The Minnesota State Veterinary Medical Association will hold its January meeting at the Merchants' Hotel, St. Paul, January 10, 11 and 12, and we are assured by its enthusiastic and energetic secretary, Dr. G. Ed. Leech, that it is to be a splendid meeting. In fact, there can be no doubt on that point after glancing over the following list of subjects and the names of the gentlemen that are to present them: "The Private Practitioner in Relation to the Contagious and Infectious Diseases in the State," by S. H. Ward, St. Paul; "Stallion Registration," from the viewpoint of the Registration Board, by Jos. Montgomery, secretary of the board; from the veterinarian's viewpoint, by Prof. Joseph Hughes, of the Chicago Veterinary College; "Animal Nutrition," by C. C. Lipp, University Farm, St. Anthony Park; "Status of Bovine Tuberculosis," by L. E. Willey, University of Minnesota, discussion by M. H. Reynolds; "Bacteriological and Seriological Abortion," by W. P. Larson, University of Michigan (Pathological and Bacteriological Department); "Shoeing and Balancing," by M. R. Higbee, Albert Lea; "Gastritis," by W. P. Anderson, New Ulm; "Poliomyelitis," by H. E. Robertson (M.D.), University of Minnesota (Bacteriological Department); "Impressions of the Mind of the Mother on the Offspring," by R. C. Nickerson, Zumbrota; "Value of Tuberculin Test on Dairy Products," by Joel Winkler, State Dairy and Food Commissioner; "Report of Examining Board."

ROUP—SWELLED HEAD—OR DIPHTHERIA IN FOWLS.

BY E. T. BOOTH, V.M.D., PHILADELPHIA, PA.

Roup in fowls is an infectious disease, the lesions of which first appear on the mucous membrane of the nasal passages, eyes, mouth, pharynx, larynx, and may extend to the trachea and bronchi and air sacs.

The disease is determined by a grayish-yellow exudate which forms upon the mucous surface of one or more of the parts mentioned.

The exudate may be so abundant as to obstruct the air passages.

In many cases or outbreaks, the loss is very great, and may destroy most or all of the birds in the flock.

There are cases on record which indicate that the diphtheria of fowls may be communicated to children and cause a serious and even fatal sore throat.

The disease is usually introduced into a flock by the exposure of the birds to sick ones at shows, or by bringing affected fowls on the premises.

There is a general belief that the disease may be developed by exposure of birds to draughts of air, or by keeping them in damp, filthy and badly ventilated houses.

My experience has been, in showing birds, that very frequently my birds have been returning from shows suffering with the disease and contribute a great deal of the cause to exposure, as express agents during show periods, which are most always in winter, carry the birds around perhaps for hours before they are delivered.

I have also witnessed where birds were shipped to shows in perfect condition and, due to the exposure, on reaching the show

they would show a watery discharge from the nostrils and the eyes, which would be the first symptoms of the disease, and lead on to further stages when the birds would show weakness and arch the back; the feathers would show roughness, and the respiration is more or less obstructed, and swallowing is difficult. There is a frequent shaking of the head and sneezing and expectoration of mucous secretions. The tongue is pale and shows grayish spots. The appetite disappears, and there follows a diarrhoea of a greenish or yellowish color. The eyes are unnaturally dilated, projecting, and possibly partly covered with a thick secretion which accumulates between the lids; the nostrils are similar.

There are various other lesions too numerous to mention, as it is not my intention to detail the pathology and post-mortem changes.

The main object in writing this article is, the loss is so great and the treatment very simple.

Many think to destroy the affected birds would be the quickest remedy; well, this might be very expensive, especially where a man has a flock of birds which he uses for show purposes and they average him anywhere from \$15 and up to a few hundred dollars a head.

Under such conditions would you advise to destroy?

These have been some of my experiences, which were many, especially during the show season.

My method is to isolate all birds showing symptoms of the disease, and disinfect the premises. If the number affected is not too many, cleanse the eyes and nostrils with mild antiseptics.

Due to the great inflammatory condition of the larynx and pharynx the birds will show great thirst. I use about a 3 per cent. to 5 per cent. solution of potassium permanganate ($KMnO_4$) and allow no other water to drink and keep the birds in a dry and warm place. I find this treatment, which is simple, to give the best results I have ever seen or heard of.

I recall birds which cost me quite considerable, where they were unable to hold their heads up, and I was compelled to

administer the solution with a small syringe every few hours; and by keeping the parts cleansed and keeping them in a warm place I have had wonderful results, with quick recoveries.

The shows have already started and the cold weather is at our doors, which means the trouble will soon be on our hands. If you have any occasion to try it, I am sure you will think as I do—we could not do without it at any price.

THE STATE BOARD OF VETERINARY EXAMINERS OF INDIANA, will meet January 9-10, 1912. Everyone desiring to practice veterinary medicine and surgery in Indiana, must, under the laws of that state as now amended, pass the examination. Prior to the amendment, graduates from reputable colleges were given licenses on presentation to the licensing board, of their diplomas, and they could demand same, even if they could not pass the state board. Particulars in reference to place where examination is to be held can be obtained from the secretary of the board, Dr. O. L. Boor, Muncie.

THE fifth annual meeting of the Georgia State Veterinary Association was held at Atlanta, December 21 and 22 last, and the question is how did they do it? How did they get into two days the amount of literary work set forth in their program? To be sure their secretary is a "live wire," and that counts for a whole lot in any organization. He says to the members, "Your interest is at stake. Parasites alone expect to reap where they don't sow." That expression surely has a wide application and should make us all "look ourselves over," and if Dr. Bahnsen is the originator of it he deserves credit.

ON page 543 of this issue will be found a report of the arrangements as perfected by the local arrangements committee of the A. V. M. A., which we are able to give to our readers through the courtesy of Secretary Marshall, who is also desirous that every member of the association should begin at once to make plans and arrange to attend this meeting. Local associations should appoint delegates and send their names to the secretary early, so that they can be printed in the program. Members of each state or province should assist their resident secretaries in procuring new members. No effort should be spared in getting every eligible veterinarian enrolled in the membership list. Applications must be in the hands of the secretary not later than July 29, 1912.

REPORTS OF CASES.

TWO CASES OF VOMITING; ONE IN A MULE, THE OTHER IN A HORSE.

By A. T. FERGUSON, D.V.S., Evansville, Indiana.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

I was called to see a mule belonging to a German. On arriving at the house, the owner stated the mule was off his feed; and on examining the animal, I found a subnormal temperature, the animal refusing all food and water. A purgative was administered with a remarkably good effect, but the animal still refused food or water. The day following he appeared to be in intense pain, as though suffering from some form of colic.

The animal would continually regurgitate food and a watery substance (a pure case of vomiting). The animal would continually lay down and stretch its front legs out their full length; this continued for some time, until he became dangerous and extremely violent.

The case looked hopeless and the prognosis doubtful; but while the animal had a spell of quiet, a capsule containing Bismo nitrox was administered; this seemed to have a remarkable quieting effect upon him, and also relieved the greater part of the vomiting. Another capsule was given one-half hour after the first, which stopped the vomiting entirely.

The after-treatment was tonics and stimulants. In two days the animal had made a complete recovery.

The second case, however, was not so easily relieved. I was called at 12 p. m. to see a gray gelding seven years old. On arriving at the barn the owner stated the animal had colic. On examination I found the symptoms of colic and 1 gr. of arecoline was given; this relieved the colicky pains, but the animal was continually belching with great force and would regurgitate

food, and an immense amount of water, both from the mouth and nostrils. The animal became dull and stupid; refused all food; appeared to have the throat paralyzed. Anodynes and stimulants were administered to relieve pain and stimulate the functions of the stomach. Bismo nitrox was given but was of no material value in this case. The animal continued in that condition without any improvement and the vomiting became so violent and so frequent that the material thrown up would in many cases return and find its way down the bronchi and into the lungs, which created broncho-pneumonia.

Treatment seemed of no avail and in twenty-four hours the animal died. I then made a post mortem and found the following conditions. The lungs were completely congested and filled with ulcers varying from the size of a hen's egg to a pea; trachea very much inflamed and bronchial tubes engorged with ulcers. The stomach was in a state of paralysis; the pyrolic was pale and flabby, gastric gland destroyed, and contained numerous ulcers in a somewhat compact arrangement and close to the cardiac entrance of the stomach. The stomach contained, besides, a large quantity of food and a great number of botts.

All other organs seemed normal. The large colon contained some undigested material. All the other intestinal tract was filled with fluid.

Now, the question comes, what caused these conditions?

The answer seems to me simple. The animal had been fed for some considerable time on tobacco to remove worms that did not exist excepting in the mind of the caretaker of the stable.

To my mind here was a clean-cut case of nicotine poisoning.

In toxic quantities, nicotine is a powerful gastro-intestinal irritant, and produces the usual symptoms of colic; pains, vomiting, purging, and collapse. All of these were present in this animal, with stupor and refusal to move, remaining in an attitude of quietude until collapse.

A TWELVE-INCH HATPIN IN A SIXTEEN-INCH DOG.

By JAMES McDONOUGH, D.V.S., Montclair, N. J.

This pup was brought to my hospital on the evening of November 21 with the history that he had been coughing since noon. While in my office he had a severe spell of coughing, but seemed bright, and showed no symptoms of pain.

The character of the cough caused me to suspect the presence of a foreign body in his throat, while a careful examination failed to disclose any trouble there.

At the base of the neck, to the right of the median line of the trachea, a pointed foreign body could be detected under the skin. I made an incision at the point through the skin and muscular tissue, but was unable to remove it. I then made an incision through the trachea and grasped with my forceps what looked like a piece of wire. When pulling it out, its direction seemed to be from below to above, and from left to right. When nearly a foot had been removed, its progress was suddenly checked; upon examination it proved to be a hatpin, with the head on the opposite side of the trachea, and in the oesophagus. I then made an incision through the opposite side of the trachea, where the pin had entered it, through which I gently pulled the head of the pin and a portion of the oesophagus, into which I made a small incision and removed the pin.



A—Opening in neck where pin was removed. B—Point of pin. C—Head of pin.

This hatpin was exactly twelve inches long, while the dog's body was sixteen inches long from the point of the shoulder, and he weighed sixteen pounds.

Absolutely no treatment was applied and he made a rapid and uneventful recovery. No anaesthetic was used, as I thought

a small incision through the soft tissue was all that would be necessary to remove the small body felt under the skin.

The dog had swallowed the pin, but how the head could reach a position that would permit of the point piercing the oesophagus and trachea on a line with his body is hard for me to understand.

The pin is made of tempered steel and very flexible, which accounts for its being perfectly straight when removed.

A CASE OF TETANUS IN A SUCKING COLT.

By CHAS. H. HART, M.D.C., Granville, Ia.

Thinking the following record of a case of tetanus in a sucking colt may be of interest, I submit same.

HISTORY.—Filly colt, three months old, lame in right hind foot. Made examination and could not discover any lesions; about thirty days after developed symptoms of tetanus.

TREATMENT.—Hypodermatic injection of alcohol 1 ounce, and the following:

B Ac. Hydrocyanicum, dil: }
Fld. ext. Gelsemium } aa.....half ounce.
Fld. ext. Physostigmatis }

M. Sig. Two drachms in two ounces of water t. i. d.

This prescription was given for three weeks; result, recovery.

“It is clear that the veterinary profession is now called upon to take a wide grasp of questions affecting the public health—the health of man as well as of animals. You cannot, indeed, dissociate the public health of man from the public health of the animal, because there are so many infectious diseases that the animal can and does transmit to man, so that human medicine and veterinary medicine have a very close alliance and association with each other. Therefore we must now look at the veterinary profession as a profession which is not only concerned in, if I may say so, the doctoring of animals, but which has to do with disease of various kinds in its wider aspect, embracing man and animals.”—(*An extract from a recent address by Sir William Turner, K.C.B., Principal, University of Edinburgh.*)

ABSTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

PARALYSIS OF THE RECTUM AND BLADDER IN A HORSE [*Capt. E. P. Argyle, A.V.C.*].—This officer's bay hunter gelding, seven years old, has always been well, and after three days' observation it is noticed that he has passed no dung and that the urine only dribbles away from the sheath. The tail being raised, it is observed that the rectum is full, the sphincter is partly relaxed and the orifice full with dung. A bucketful of it is removed by hand. On rectal examination the bladder is found full and painful on pressure. Slight relief is obtained by hot fomentations on the loins and perineum, with also enemas. Exercise, change of diet are followed by same condition and occasionally a normal motion of the bowels. There had been at some time fracture of the ischium. Soon the inside of the sheath becomes sore and excoriated. Electricity gave no benefit, aloes only temporary relief, tonics and nervous stimulants are negative. The gluteal muscles become atrophied, the case gradually grows worse and the animal is destroyed. At the post mortem were found: bladder with indurated and thickened walls. It is half full of urine, thick and containing a good deal of sabulous matter. It is ulcerated here and there. Rectum is abnormally distended, its mucous membrane pale and thickened. Spinal cord being exposed, the dura mater is inflamed. In the lumbar region there are two abscesses about the size of a bean and containing black pus. One is situated between the first and second lumbar vertebrae, the other between the last vertebrae and the sacrum. The paralysis was due to these lesions.—(*Vet. News.*)

SULPHATE OF MAGNESIUM AND TETANUS [*W. A. Dykins, M.R.C.V.S.*].—This is the record of a successful use of this salt in the treatment of tetanus in a heifer. The animal had already been sick for some days. She had calved, was delivered and cleaned without antiseptic precautions, and had been noticed

ailing some seven days before. The beast was standing in a Kraul, in great distress, with a rigid posture, head extended, tail straightened and elevated. She would lay down but had to be assisted to get up. Trismus had been severe but improving. Muscles of the neck, chest, loins and limbs showed some severe spasms. Nostrils were dilated and membrane nictitans protruding over the eyeball. Animal showed accentuated reflexes. Breathing and pulse accelerated. Temperature normal. Obstinate constipation. The treatment was the administration of sulphate of magnesia. She had already taken two pounds of salts from the owner and received two subcutaneous injections of saturated solution of the salt, 40 c.c. a day, 20 on each side of the neck. Those were kept up for a few days. Recovery followed.—(*Vet. Record.*)

CARCINOMA OF THE VULVA IN A MARE [L. W. Wynn Lloyd, M.R.C.V.S.].—Fourteen years old, this mare had a growth the size of a man's fist, ill defined, fixed on the lower third of the lips of the vulva and along the floor of the vagina for about two inches. It seemed not to interfere with the animal beyond matting the hair on the tail and covering the buttocks with blood and discharge. The parts were thoroughly washed and cleaned with antiseptics and codrenin injected in several points of the tumor. The lips of the vulva being kept apart by an assistant, the growth was dissected and the parts treated antiseptically. The histological examination made the tumor one of carcinomatous nature.—(*Vet. Journal.*)

CAESARIAN SECTION IN A BITCH [G. Mayall, M.R.C.V.S.].—“Midge” was twenty-two months old and pregnant with her second litter. She was delivered of one dead pup and the nose of a second could only be touched by examination. Extract of ergot does help her only a little and delivery seems impossible except by smashing the cranial bones. This was done, but even then the extraction of this foetus cannot be made. Caesarian operation is suggested. The owner consents and the abdomen being open, the uterus being explored, one pup is found and extracted. The uterus was well scrubbed with chinosol solution and the wound closed with two rows of sutures on the uterus, the abdominal muscles with catgut, and the skin with hempen cord. Dressing was put over. The animal tore it after a few days, also some stitches. This complication was, however, prop-

erly managed and ultimate recovery followed. Most careful diet of milk and barley water was carried out for a few days.—(*Vet. Journal.*)

AN UNUSUAL CASE OF POLL EVIL [*H. D. Jones, M.R.C.V.S.*].—Case, illustrated by photos, of a cart mare which had been treated several times for swelling over the poll. Difficult animal to handle, no surgical treatment had been attempted before. The swelling would break, discharge, close and return after variable space of time. Recently the swelling appeared very large, broke, and the animal was cast for proper examination. In so doing the instrument became in contact with bone. The ligamentum nuchæ was curetted, drainage secured and the animal allowed to rise. Twenty-four hours after she was found in her box, unable to get up. Spinal complications were suspected and the mare destroyed. On examination of the parts it was found that the ligamentum nuchæ was somewhat diseased, that there was bony deposit on the occipital and also on the floor of the vertebral canal. The atlas was ankylosed with the occipital. No condyles could be seen and the styloid process of the right side was ankylosed to the wing of the atlas. There were no movements of any sort between the skull and the atlas.—(*Vet. Record.*)

CONGENITAL DIAPHRAGMATIC HERNIA [*W. R. Davis, M.R.C.V.S.*].—Since born, three weeks previous a valuable thoroughbred foal has been healthy, when one morning she is noticed in the paddock standing by herself and breathing quickly and with difficulty. Her temperature was 103° F. and pulse not greatly disturbed. The nostrils are dilated and the breathing disordered and like in a broken-winded animal. By auscultation, no respiratory murmur is detected on the left side but sounds distinctly intestinal. On the right side the respiratory murmur is heard and also intestinal rumbling as on the left, but more obscure. The mother and foal were kept for three weeks, the little patient sucking well and being quite lively. One day when feeding the mother, the foal took some of the food, which brought on a severe attack of indigestion. Although the temperature had become normal and the pulse about so, the auscultation gave always the same symptoms. Once the foal and mother were turned out to grass. The foal started galloping but quickly came to a standstill, legs apart, nostrils dilated and flanks heav-

ing. The condition was such that the owner was advised that the little animal could never make a race horse and had better be destroyed. A few days after she took colic and died. At the post mortem there was found a "large orifice in the diaphragm, low down and towards the left side, the hiatus being due to a want of continuity between the phrenic and the muscular portions of the diaphragm. The small intestines and a portion of the colon, with most of the caecum, together with the left lobe of the liver, were lying in the thoracic cavity."—(*Vet. Record.*)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

PAPILLOMATOUS LARYNGO-TRACHEITIS [*Prof. G. Petit and R. Germain*].—Observations of sudden death by asphyxia due to inflammatory or neoplastic lesion of the larynx or trachea are not common conditions in animals no more than in man. This and the following from the same authors are interesting.

Bulldog, two and a half years old, was eighteen months ago taken with distemper complicated with broncho-pneumonia which has left a nasal discharge rebellious to all treatment. This is muco-purulent, abundant, unilateral, or again bilateral. It increases by exercise. There is dyspnoea during meals. Examination localized his trouble as being in the laryngo-tracheal region. Examination of the mouth brings out an escape of muco-pus coming from back the soft palate. As the dog is threatened with suffocation, the examination is postponed to the next day when tracheotomy will be performed. At 11 o'clock the next day the dog seems in good condition; at 12.30 he is found dead, having been asphyxiated while taking his meal.

Post mortem showed the laryngeal and tracheal mucous membranes covered with thick, sticky muco-pus, and two tumors which close almost completely the larynx. One is small and spherical on the right ventricle of the glottis, the other papillomatous and exists on the right vocal cord. On the left cord were also smaller warty elevations.—(*Bullet. de la Soc. Cent.*)

FATAL PHLEGMONOUS LARYNGO-TRACHEITIS [*By the same*].—Twelve-year-old dog is on treatment for a severe dyspnoea.

Great anxiety, eyes protruding, respiration slow. The thorax dilates beyond measure, ribs are rising under the skin, flank and abdomen are retracted. The throat is very painful, the slightest pressure promotes hard whistling cough, with escape of greenish muco-purulent discharge. Deglutition is very difficult. The dog is found dead one morning in his kennel. *Autopsy*: Greenish muco-pus in great quantity in the larynx and upper half of the trachea. Mucous membranes are inflamed and have an haemorrhagic aspect. They are thick. There is an abscess on the right vocal cord whose contents have affected the cricoid cartilage, which is necrosed. On the left side, on the level with the three first tracheal rings, the mucus is so thick that partial occlusion of the canal takes place.—(*Ibid.*)

OPEN FRACTURE—SUTURE OF THE BONE [*MM. Dumazel and Lappérousaç*].—Four-year-old Gordon setter had an open fracture of one hind leg. The tibia and fibula are fractured obliquely, and the extremities protruding without periosteum, and containing a grayish and purulent marrow. The tissues surrounding are more or less involved and the seat of a large swelling which extends on the whole leg. Treatment is carried out by first thorough disinfection, then application of silicate of potash, splint leaving free access to the open wound. By careful attention, continued disinfection and proper diet the condition of the animal was improved and all was doing well except the immobilization and union of the two ends of the fractured bones. However, towards the twentieth day, as all dangers of septicæmia had subsided, the animal was put to sleep and, the bones being well put in place, fine gimlet holes were made through which strong metallic wire was passed and the bones properly secured. A second circular ligature was also applied. The same treatment was then resumed. The antiseptics did their work well. Little necrosed pieces of periosteum and splinters of bone exfoliated by degrees, and although the dog tore his dressing once, no harm followed as union was then well established. Recovery was perfect (*Journ. de Zootech.*)

EMBRYO OF FILARIA AND SYMPTOMS OF DOURINE [*Capt. Darmagnac*].—Stallion, "Maiettobe V." has a cold, painless swelling of the sheath which keeps on getting bigger and spreads under the belly. He also has oedematous pimples on the neck and croup. A few days later there appears on the ribs of the

right side a circular patch resembling those observed on the skin in dourine. After remaining present for about two weeks, these symptoms gradually subsided and left no mark except that on the sheath there remain spots of lost pigmentation, which give it a peculiar aspect.

The examination of the blood, taken round the swelling of the sheath and the cutaneous lesions revealed the presence of a very mobile parasite, differing entirely from the trypanosome of the dourine and was an embryo of filaria. It was vermiform, rounded at one extremity and thinned out at the other. It was clear white with darker points on the body. He moved rapidly. It colors easily with blue of methylene or thionine. Its disappearance coincided with that of the lesions. Inoculations to rabbit and dog were negative. The horse received two subcutaneous injections of 5 grammes of Atoxyl.—(*Rev. Gen. de Med. Vet.*)

MELANOSIS TREATED SURGICALLY [*Capt. G. Remond, Army Vet.*].—Light gray gelding, with no previous pathological history, is carrying numerous melanotic tumors through the thickness of the dermis, which vary in size between that of a hazel nut and that of a big French nut. Located principally on the region of the back where the saddle is put, on the croup, and on the internal face of the legs; some are spread also on the lateral faces of the thorax, where surcingle is applied. On this account the animal could not be saddled; he was useless and proposed for reform. Before that, however, surgical treatment was suggested. All the tumors that were visible except those of the base of the tail and inside of the thighs were removed. After twenty days' treatment the horse was able to resume his work, the cicatrization having taken place rapidly and without complication. The horse could be saddled and harnessed. No relapse has occurred so far.—(*Rec. and Med. Vet.*)

ATROPHY OF THE CEREBELLUM IN A NEW-BORN CALF [*Mr. V. Robin*].—Since birth this calf has presented curious nervous symptoms. He generally lays in complete lateral decubitus, the head greatly extended on the neck, and remains in absolute immobility. If he is made to get up he cannot stand, is unable to keep his equilibrium, shakes on his legs and drops. The general sensibility of the trunk and limbs is entirely abolished; long pins thrust in its ischio-tibial muscles have no effect; but on the contrary the cutaneous sensibility about the head seems exaggerated. Pricks on the nose are painful. Hearing and

sight seem normal. If a finger is introduced in his mouth, the calf sucks on it; also if a teat is pushed in; but if this drops out the animal does not try to take it up with his tongue. If water is offered to him in a pail, he dips his head down to the bottom, fearless of asphyxy. At intervals, or under the influence of more or less severe excitement, he has tonic contractions of his muscles, the head is carried on opisthotonus, and the eyes rolled in the orbits. The calf is killed. *Autopsy*: Meninges greatly congested, also the cerebral substance. The cerebellum offers the principal lesion, being half its normal size. It weighs 7 grams. Its lateral lobes present in their centre a marked depression, at the bottom of which the gray substance is wanted. However, on a longitudinal and median section the ramifications of the arbor vitæ are normal except on the sides corresponding to the depression of the lateral masses. The author considers the case as a simple arrest of development and not as a regressive phenomena.—(*Rev. Veter.*)

IF you want to pass through any turnstile on this continent, just tell the man at the wicket that your name is G. Ed. Leech.

FOURTH ANNUAL SMOKER OF THE VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY—Those who were fortunate enough to attend the "smoker" given by the above association one year ago, will need no urging to get them there again this year; it would be more of a task to keep them away, especially when they learn that the same committee, with Dr. Charles E. Clayton as chairman, will again have charge of the affair. To those who were so unfortunate as *not* to have been there last year, we will say, *do not let it get past you this year!* It will be held as on previous occasions, at Reissenweber's, Fifty-eighth street and Eighth avenue, on January 17, 1912, at 8.30 p. m. The tickets will be \$2 and can be obtained from the chairman of the committee, Dr. Chas. E. Clayton, No. 207 West Fifty-fifth street (Manhattan); from Dr. E. Ackerman, of the committee, No. 167 Clymer street (Brooklyn); of Dr. Maffitt Smith, also of the committee, No. 43 West Ninetieth street (Manhattan), or from the secretary of the association, Dr. R. S. MacKellar, No. 351 West Eleventh street (Manhattan). No better form of relaxation from the strain and exactions of practice can be indulged in than attendance at this so-called smoker.

BIBLIOGRAPHY.

MEAT HYGIENE.

A TEXT-BOOK OF MEAT HYGIENE. WITH SPECIAL CONSIDERATION OF ANTE-MORTEM AND POST-MORTEM INSPECTION OF FOOD-PRODUCING ANIMALS, by Richard Edelmann, Ph.D., Medical Counsellor; Royal State Veterinarian of Saxony; Professor at the Royal Veterinary High School in Dresden. Authorized Translation Revised for America, by John R. Mohler, A.M., V.M.D., Chief, Pathological Division, U. S. Bureau of Animal Industry, and Adolph Eichhorn, D.V.S., Senior Bacteriologist, Pathological Division, U. S. Bureau of Animal Industry. Octavo, 392 pages, with 152 illustrations and 5 colored plates. Cloth, \$4.50 net. Lea & Febiger, Publishers, Philadelphia and New York, 1911.

Meat hygiene is one of the most important subjects that confronts mankind to-day. A meat that is free from disease and in condition not to *cause* disease to mankind when used as an article of food; and no other product is more universally so used by the human race. Realizing this, and the necessity for careful inspection of meat, based upon a thorough knowledge of the diseases to which meat-producing animals are heir, the authors have spared no effort in producing a work that covers every phase of the subject; and the world owes a debt of gratitude to these scientists, who, in the midst of their labors, have given enough of their time for its production. The author of the original German edition is a doctor of philosophy, medical counsellor, royal state veterinarian of Saxony and professor of the Royal Veterinary High School at Dresden; and the two gentlemen who have translated the work into English and made such changes in it as were necessary for its perfect adaptation to American requirements are veterinarians and scientists of the highest order to be found in *any* country; holding the most important positions in relation to animal pathology in the government of the United States. It is to that type of men, who have given of their precious time and from their unusual experience, that the world is indebted for *Edelman, Mohler and Eichhorn's Meat Hygiene*. The thirteen chapters into which it is divided, treat thoroughly and in a most interesting manner, of the Origin and Source of Meat Food; Morphology and Chemistry of the Principal Tissues and Organs of Food Animals; the Production, Preparation and Conservation of Meat; Regulations Gov-

erning Meat Inspection of the United States Department of Agriculture; Organization and Methods of Procedure of the Inspection Force; Decisions of the Veterinary Inspectors and Disposal of the Condemned Meat; Abnormal Conditions and Diseases of Food-Producing Animals; Infectious Diseases in Food-Producing Animals; Postmortem Changes of Meat; Examination and Judgment of Prepared and Preserved Meats, Chickens, Game, Fish, Amphibia and Crustaceans; Meat Poisons; History of Meat Hygiene, and Abattoirs and Stock Yards. The 152 illustrations, embracing as they do, methods of casting a bull, a stock car for transportation of live animals, appliances for branding and tagging, methods of killing and appliances, sides of beef, veal, mutton, hog, etc., showing the commercial cuts, others displaying all the different glands, vertebræ, forearms, scapulas, etc., etc., of different animals used for food, interior of a refrigerating railroad car for transportation of meat, and everything in fact that has to do with the subject, together with the colored plates illustrating pathological conditions of the liver, lung, kidney, udder, etc., distributed throughout the work, materially assist in a clear understanding of the subjects under discussion. No detail of the work, in connection with the preparation and preservation of meat, seems to have been too small to merit attention at the hands of the authors, who, through their publishers, have presented to the public a work that is indispensable not only to those engaged in meat and food inspection, but to *every* veterinarian, all of whom are interested in the vital subject of healthful food products.

DORLAND'S AMERICAN ILLUSTRATED MEDICAL DICTIONARY.

The New (6th) Edition Revised.

DORLAND'S AMERICAN ILLUSTRATED MEDICAL DICTIONARY. A new and complete dictionary of terms used in Medicine, Surgery, Dentistry, Pharmacy, Chemistry, Veterinary Medicine, Nursing, Biology, and kindred branches; with new and elaborate tables. Sixth Revised Edition. Edited by W. A. Newman Dorland, M.D. Large octavo of 980 pages, with 323 illustrations, 119 in colors. Containing over 7,000 more terms than the previous edition. Philadelphia and London, W. B. Saunders Company, 1911. Flexible leather, \$4.50 net; thumb indexed, \$5 net.

This most excellent work is indispensable to students, practitioners or writers in any branch of medicine. Convenience of

consultation, as a result of careful arrangement of matter by the editor, making it possible to obtain the information sought in the shortest possible time and with the least possible difficulty. Special attention has been given to the wording of definitions, with the intention of making them clear, concise and yet sufficiently complete. Its value to the three classes in medicine, or veterinary medicine, mentioned above becomes apparent when we note that under each drug are given its composition, sources, properties, uses and dose; under the more important diseases, an account of their etiology, symptoms, etc.; under the principal organs, a description of their structure and function. Then there will be found in addition to the anatomic and clinical tables, specially prepared tables of tests, stains and staining methods, methods of treatment. Besides which, thirty-six pages have been especially devoted to posology and therapeutics, as a sort of an appendix at the back of the book. The illustrations in this work are especially commendable, 119 of the total of 323 being in colors, comprising beautiful anatomical, physiological and pathological plates. The important features of pronunciation and derivation have received the most careful attention. In short *Dorland's American Illustrated Medical Dictionary* is indispensable to physicians, veterinarians and dentists, as it has proved itself to be to the reviewer, on whose desk it has had a constant place since its fourth edition (1906). The publishers deserve great credit for the high class manner in which the work has been gotten out; bound in flexible leather, of rich red, with gold lettering, it is a volume that anyone may be proud to possess.

DORLAND'S AMERICAN POCKET MEDICAL DICTIONARY.

The New (7th) Edition.

DORLAND'S AMERICAN POCKET MEDICAL DICTIONARY. Edited by W. A. Newman Dorland, M.D., editor "Dorland's American Illustrated Medical Dictionary." Seventh Edition, 32 mo. of 610 pages. Philadelphia and London, W. B. Saunders Company, 1911. Flexible leather, gold edges, \$1 net; thumb indexed, \$1.25 net.

This beautiful little volume, a miniature of *Dorland's American Illustrated Medical Dictionary*, has been edited with the same care as the former, and is, therefore, just as accurate, and has the advantage of being sufficiently small to be carried in the

pocket, as a result of brevity, where the larger dictionary elaborates, and is without the illustrations. But it does just what its editor aimed to have it do, it fills the need for a pocket medical dictionary, not only for physicians, but for veterinarians, and fills that need perfectly. Carriage, automobile or train riding, is not conducive to the reading of extensive definitions or the studying of illustrations; we want quick and concise definitions; the *extensive* study is for the office and library. The editor has therefore provided for both conditions with two volumes in a manner that it would not be possible to provide for them in one volume. This little pocket dictionary has an index to all the tables, so that they can be located without any delay, has tables of weights and measures, both in the apothecary and metric systems, has a table of doses in both systems for the physician and another one especially arranged for the veterinarian in both systems of measurement. So that it will be seen that *Dorland's American Pocket Medical Dictionary* stands in the same position as the larger one, *it is indispensable*. All veterinarians should have them both. With this little work, the publishers have again displayed their exquisite taste and familiarity with high-class work. Like the larger work, it is bound in soft, flexible leather, with gold lettering and gold edges.

DR. A. N. LAWTON, Brodhead, Wis., is building a new \$1,000 hospital and a \$3,000 residence on a prominent corner of the main thoroughfare of that city. We congratulate the doctor on his enterprise.

THE State Board of Agriculture of the Colorado State Agricultural College, at its semi-annual meeting held in December, changes the degree in veterinary science from Doctor of Veterinary Science to that of Doctor of Veterinary Medicine, and the name of the Division of Veterinary Science to that of Division of Veterinary Medicine. What state board will be next?

At the November meeting of the Veterinary Medical Association of New York City, a donation of twenty-five dollars (\$25) was voted to the monument fund of Prof. S. Arloing. While that is not a large sum of money, yet it shows a spirit of appreciation on the part of that little organization, of Prof. Arloing's contributions to the advancement of veterinary science; and the emulation of its act by *every* veterinary association would be commendable.

ARMY VETERINARY DEPARTMENT.

THE NEW ARMY VETERINARY BILL.

The Maneuver Division, mobilized at San Antonio, Texas, during the Mexican revolution, brought together eight army veterinarians. Early in April letters were received from other army veterinarians, requesting us to use this representative gathering to draft a new army veterinary bill on improved lines, as the old bill (H. 1964) was looked upon by the authorities as disposed of by the enactment of the retirement clause for army veterinarians.

In response to this call, a preliminary meeting was arranged in the camp to consider the proposals made by the correspondents. This resulted in a draft of a bill principally along the lines suggested in 1908 by Major Cameron, 7th Cavalry, then Assistant Commandant of the Mounted Service School. The draft was submitted to the five veterinarians stationed at Fort Riley for correction and approval, and on its return was printed and circulated among all other army veterinarians in the United States, the Philippines and Honolulu for further criticism and approval.

The draft of the bill was unanimously approved by all present in the States, but objected to by those in the Philippines. This resulted in a long delay and in several protracted meetings. By incorporating the wishes of the majority, by asking advice of influential army officers, and by engaging legal counsel, a bill was finally perfected that overcame the principal objections raised and met the full approval of the great majority.

The labor entailed in the preparation of this bill was incessant and often trying, yet the patience and good will displayed by the veterinarians in camp was most commendatory. The strong *esprit de corps* that developed during the debate of the bill, by an animated correspondence, was interesting, as indicating an advance all along the line in ideas, in unity of purpose and action.

From the above account it should appear that the new bill is not a one man's measure. Still, some colleagues have assailed me as the sole author of everything bad in the bill, while others

have given the bill my name. In justice to the other seven veterinarians in camp, Drs. Le May, Glasson, Gage, Gould, Mitchell, and later McDonald and Lytle, I must protest this honor, as all of them have equally shouldered work and responsibility. This new bill is essentially a compromise, embodying the ideas and wishes of nearly every one heard from. No one man's bill would have found more than a very few supporters, so radically different are the opinions of many, and we aimed at a measure that should bring us all into line. It is true that not all wishes could be considered. Those of a purely personal consideration had to be thrown out, because we were in equity bound to consider equally well the probable wishes of the War Department and the standpoint likely to be taken by our national legislators. No measure enacted for the mere individual relief does ever bestow real good upon the schemer, while a generally progressive law reacts beneficially upon all and everyone. Above all, Congress is generally favorably inclined towards a proposal that appears broad and comprehensive, because it is something worth while to consider.

One of the objections raised was against the consolidation of the army veterinary service. Happily, it was sustained by the majority, and the wisdom of doing so is becoming already apparent. According to service papers, the Quartermaster General, United States Army, intends to again ask Congress to raise the pay of the civilian veterinarians employed in his department. The Commissary General is in a quandary where to place his veterinary inspectors in the newly proposed bill creating a general supply department. If we had confined our bill to merely seek an improved position for the veterinarians of cavalry and field artillery, we would have witnessed a piece-meal veterinary legislation that would do the Government no good and would remain a farce as viewed from our professional standpoint.

Thus the need of a homogeneous veterinary force in our army is coming to the front by a succession of events over which we had no direct control. The Maneuver Division, too, plainly demonstrated that the army wants an improved veterinary service by establishing a field veterinary hospital with a capacity for one hundred horses, and by introducing veterinary sanitary measures. The results obtained were favorably commented upon by the commanding general and all officers concerned, and steps were taken to institute in the future a systematic service for a division in the field to be under the supervision of a chief veterinarian.

When all such things happen, we must be alert to read the signs of the times and to seize the opportunity offered for a general advance along the line of veterinary progress. The ultra conservatives among us should consider that the new bill provides only for so much of an advance as we, in a body, can shoulder at the present time, with a view to make it a success. Later, veterinarians can then build up on the foundation.

The new bill and brief are now out of our hands, to be brought forward to the proper places by men chosen to do so by our national association. We bespeak success for them, because this new measure is pre-eminently one appealing to the sense of economy of our congressmen; to the sense of humanity of those who wish our horses properly treated, and generally to those in the army who want them to be preserved healthy and serviceable.

OLAF SCHWARZKOPF.

A BILL

To consolidate the Veterinary Service, United States Army and to increase its Efficiency.

Be it enacted, etc., that the President is hereby authorized by and with the advice and consent of the Senate, to appoint Veterinarians and Assistant Veterinarians in the Army, not to exceed two such officers for each Regiment of Cavalry and Field Artillery, three as Inspectors of Horses for the Remount Depots, one as Purchasing Officer of veterinary supplies, five as Inspectors of Meats for the Subsistence Department, three as Veterinary Examiners and Instructors, and one to act as Chief Veterinarian, not to exceed fifty-five (55) in all.

Sec. 2. That hereafter a candidate for appointment as Assistant Veterinarian must be a citizen of the United States, between the ages of twenty-one and twenty-seven years, a graduate of a recognized Veterinary College or University, and that he shall not be appointed until he shall have passed a satisfactory examination as to character, physical condition, general education and professional qualifications.

Sec. 3. That an Assistant Veterinarian appointed under Sec. 2 of this Act shall have the rank, pay and allowances of 2nd Lieutenant, mounted; that after three years of service an Assistant Veterinarian shall be promoted to the rank, pay and allowances of 1st Lieutenant, mounted, provided he passes a satisfactory examination under such rules as the President may prescribe as to professional qualifications and adaptability for the mounted service; or if found deficient he shall be discharged from the Army with one year's pay and have no further claim on the Government; that after fifteen years of service an Assistant Veterinarian shall be promoted to Veterinarian with the rank, pay and allowances of Captain mounted, after having passed such physical and professional examination as the President may prescribe; and that from the Veterinarians with the rank of Captain one shall be selected to act as Chief Veterinarian for the period of four years, and while so serving, he shall have the rank, pay and allowances of Major.

Sec. 4. That the Veterinarians of Cavalry and Field Artillery together with the Veterinarians of the Subsistence Department, now in the Army, who

at the date of the approval of this Act, shall have less than three years of service, be reappointed and commissioned as Assistant Veterinarians with the rank, pay and allowances of 2nd Lieutenant, mounted; that the Veterinarians who have over three years of service, be reappointed and commissioned as Assistant Veterinarians, with the rank, pay and allowances of 1st Lieutenant, mounted, provided they pass a prescribed practical professional examination and a physical examination as to fitness for mounted field service, or in the case of Veterinarians of the Subsistence Department, if their services have been satisfactory to the Commissary General; that the Veterinarians with fifteen years of service be reappointed and commissioned as Veterinarians with the rank, pay and allowances of Captain, mounted, provided they pass a prescribed practical professional examination and a physical examination as to fitness for mounted field service, and that they shall be entitled to credit for all honorable prior service in the Army as veterinarians or veterinary surgeons in determining their status; provided, further, that veterinarians now in the Army, who fail to pass the prescribed physical examination, due to disability incident to the service, shall be retired with the rank, pay and allowances corresponding to length of service as prescribed herein.

Sec. 5. That the Secretary of War upon the recommendation of the Chief Veterinarian, with the approval of the Quartermaster General, may appoint such number of Reserve Veterinarians as may be necessary to attend public animals pertaining to the Quartermaster's or other Departments and Corps, who shall have the pay and allowances of 2nd Lieutenant mounted; provided that such Reserve Veterinarians be graduates of a recognized Veterinary College or University, and have previously passed such moral, professional and physical examination as may be deemed necessary by the Secretary of War for the proper performance of their duties in mounted field service.

Sec. 6. That the Secretary of War is authorized to appoint Boards of Examiners to conduct the examinations prescribed herein, one member of which shall be a Field Officer, one a Surgeon, and two Veterinarians.

Sec. 7. That all laws or parts of laws in conflict with the provisions of this Act be, and are hereby repealed.

BRIEF

SHOWING THE NECESSITY OF THE ENACTMENT OF THE PROPOSED BILL: "TO CONSOLIDATE THE VETERINARY SERVICE, UNITED STATES ARMY, AND TO INCREASE ITS EFFICIENCY."

Inquiries into the organization and the working of foreign armies show that they all maintain Veterinary Departments or Corps, which are considered a necessary economic branch of the military service. If we examine into the nature of the various services rendered by this department of their armies, we find that it performs the following functions: The enforcement of veterinary hygiene to prevent sickness among horses; the medical and surgical treatment of injuries and diseases; the supervision of horseshoeing; the expert examination of remounts; the economic

purchase of veterinary instruments, medicines, horseshoes and horseshoers' tools; the instruction of officers, non-commissioned officers, farriers and horseshoers in hippology; the inspection of forage and of saddlery; the inspection of cattle and meat intended for army consumption; the administration of garrison—and field—veterinary hospitals; in war, the suppression of contagious disease among horses and cattle belonging to the invading army and to the people of the besieged country.

To perform these manifold duties adequately, the veterinary officers of foreign armies are required to be educated professional men, and, before entering the military service, they must undergo a special course of training in an army veterinary school to learn the particular needs of the army veterinary service. In order to secure such competent veterinarians and to keep them in the service, they have long since been given such rank and promotion as their education and services demand, and as the proportionate strength of the larger or smaller armies calls for. Whatever the size of the different veterinary corps of foreign armies may be, they are all supervised by a competent chief veterinarian; because the practice of veterinary science is so much of a specialty that it cannot be successfully directed by laymen, such as officers of other branches of the military service naturally are.

That the foreign army veterinary corps work well and satisfactorily and that the outlay for their maintenance results in true economy and is part of the proper construction of an army, is proven by the yearly statistical reports of European armies. Among the forces employed in an army not all are intended to be destructive, and among the constructive forces is an army veterinary corps. It carries within itself great economic possibilities, which have been carefully developed in all civilized armies, but remain untouched in the United States Army.

THE VETERINARY SERVICE OF THE UNITED STATES ARMY. HISTORY OF LEGISLATION.

Not until the Civil War were efforts made to establish a veterinary service in our army. From authoritative sources we learn that "the waste of horseflesh that took place during the early part of the war was enormous (Mil. Laws, U. S.). Complaints about this unprecedented loss of horses induced President Lincoln to offer commissions as lieutenants to several of the best qualified veterinarians of that time, but they refused to accept unless they were given the rank of captain. Congress, too, grad-

ually realized the need of veterinary attendance in the army, and on March 3, 1863, cautiously enacted as follows: Each regiment of Cavalry shall have one Veterinary Surgeon with the rank of Sergeant Major, whose compensation shall be seventy-five dollars per month. While the veterinary surgeon provided for by this act was an enlisted man, yet "General Orders, No. 259, 1863, W. D., directed that he should be selected by the Chief of the Cavalry Bureau upon nomination of a regimental board of three officers next in rank to the regimental commander; the name of the persons so selected was then submitted to the Secretary of War for appointment. Notwithstanding this elaborate process devised by the War Department, it appears that the results were unsatisfactory" (Capt. Chitty). This view seems to be substantiated when we read that at the Remount Depot at Giesboro Point, near Washington, D. C., 20,000 horses were kept for recuperation, and hospital stables were erected with a capacity for 2,650 sick horses. But, owing to the lack of efficient veterinary treatment, 24,321 sick or wounded horses died or were shot at this depot from January 1, 1864, to June 30, 1866, when it was abandoned.

After all this had happened, Congress added to the army, on July 28, 1866, four more Veterinary Surgeons, with the pay of \$100 a month. Thereafter they were to be considered as civilian employees; but the rank of sergeant major was retained on their appointment certificates.

This unclear definition of the status of the veterinary surgeon, with its train of anomalous conditions, remained in vogue until 1899, and was to a great extent the cause of the periodical vacancies in the veterinary service of the army. For years attempts were made, by interested cavalry officers, to improve the veterinary service. Unfortunately, this was done more by trying to force upon the veterinarians experimental treatments, rather than by raising their position so that qualified men would enter and remain in the service. For instance, homeopathic specifics were tried in 1873; other proprietary medicines were furnished in 1876; and again recourse was taken to a regular veterinary supply table in 1879.

Finally it became clear that the veterinary service could only be improved by Congressional legislation. Consequently, early in 1888, General Sheridan approved a bill entitled: "To provide for the proper compensation and rank of the Veterinarians of the U. S. Army," which aimed to give them a commission as

second lieutenants. The General himself cut down the bill offered by the army veterinarians "to what he thought Congress would stand for." However, he died in August, 1888, and with him this bill. Similar measures were later introduced into Congress between the years 1890 and 1896, though none of them, seemingly, ever had a chance of enactment.

As a result, the Spanish-American War found the veterinary service again unorganized and feeble. The corrals at Chickamauga Park became hotbeds for the propagation of glanders among horses, a destructive disease, which was afterwards carried to civil communities of several Southern and Eastern states through the release of horses of the militia or by sale of superfluous army horses.

Again, this experience, like that during the Civil War, acted as a lever for new army veterinary legislation. Several intelligent veterinarians in civil life induced the Chief of the Bureau of Animal Industry, U. S. Department of Agriculture, to recommend to Congress a bill creating an army veterinary organization with a veterinary director as its head. This bill passed the House Military Committee, but was opposed in the Senate. In lieu a measure was adopted on March 2, 1899, providing that each regiment of cavalry shall have two veterinarians, one appointed after passing a competitive examination, with the pay and allowances of a second lieutenant, and one appointed without examination, with the rank of sergeant major and the pay of \$75 a month.

Such half-hearted legislation could accomplish but little improvement, if any, and did not appeal to the men in the civil veterinary profession who wished the army to have an efficient veterinary service. A new bill was, therefore, introduced in January, 1900, as an amendment to the Army Appropriation Bill, providing for a veterinary corps, to have a chief veterinarian with the rank of colonel, and forty-five other commissioned veterinarians in the lower grades. This bill passed the Senate on May 5, 1900, and the House of Representatives on June 2, 1900. Notwithstanding that, it was reconsidered at the express wish of the War Department, and a substitute amendment was passed, which merely abolished the grade of Veterinarian, II. Class, giving to all veterinarians the pay and allowances of second lieutenants. This law is still in force to-day.

In 1904 the army veterinarians themselves agreed on a bill asking for a commission of first lieutenant after five years of

service, and that, from among those so promoted, one be selected to act as chief veterinarian. This bill was changed by the General Staff, U. S. Army, to provide for only the pay and allowances of first lieutenant after ten years of service and the status of a commissioned officer as regards retirement, pension, etc. So altered, the bill passed the Senate twice, in February, 1908, and in June, 1910, but was never reported from the Committee on Military Affairs of the House of Representatives. One section of this bill, providing for the retirement of veterinarians, was enacted as an amendment to the Army Appropriation Bill of March 3, 1911.

PRESENT STATUS OF VETERINARIANS.

The official status of the veterinarian remains, therefore, as follows: He has the pay and allowances of a second lieutenant, mounted, but has not the rank of a lieutenant. He has no promotion and, throughout his service, is carried on the returns below the youngest lieutenant. He can retire on disability or at the age of sixty-four years. He is not a responsible officer and a commissioned officer must be held responsible for his professional instruments, supplies, etc. At posts without a veterinary hospital, the medicines are supplied to the troops and not to the veterinarian. He cannot sign a certificate, but must swear to an affidavit, as do enlisted men. A certificate of health for public horses for interstate transportation is not accepted by state authorities from him because he is not an officer. He is rated as a non-combatant, yet goes to the front with the troops; but is not allowed to wear a sabre, the only protective arm internationally authorized for non-combatants. The youngest lieutenant entering the army can rank him out of his quarters, although he may have many years of service and a family. His prescribed service uniform resembles that of an officer, but his dress uniform is shorn of the shoulder straps, so that he looks similar to a private of the band of his regiment. He is forbidden to wear the insignia "U. S." as collar ornaments, although he is by law a part of a regiment of cavalry or field artillery, two distinctly fighting arms. These are a few of the inconsistencies and discriminations, shameful to mention, that bitterly offend the feelings of the young army veterinarian and insult his sense of manliness.

The older veterinarian suffers most from the inequality of rank that becomes apparent after a few years of service. From

below him, out of the ranks of enlisted men or from civil life, young men are constantly overstepping him. The rejuvenation of the army is completed, promotion is rapid, and young officers are quickly advanced in rank to first lieutenant, captain or major, while the veterinarian becomes gray-haired in a stationary position that is underpaid from a professional standpoint. It is still more painful to him when young veterinarians from civil life, who come to maneuvers as captains or majors of the National Guard, admonish him for remaining in a position without rank or proper pay. This state of veterinary affairs in the army is now fully known at veterinary colleges and universities, and graduates are warned against this career. A young veterinarian may enter the army with hope and pride in his calling; but both are likely to vanish as soon as he fully comprehends his troublesome position, and the utter absence of advancement and promotion. The result is he either resigns from the army to avoid further annoyances and to seek better prospects in civil life, or, if circumstances compel him to stay in the service, he becomes indifferent, attending to his professional duties as a mere matter of routine, to the detriment of himself and the service.

Of course, there always have been army veterinarians with strong characters, who have manfully endured the iniquities of this position, and have steadily and quietly worked for the improvement of the veterinary service. From their ranks substantial and lasting improvement would come quickly if they were given by Congress a position commensurate with needed professional authority. Necessarily, rank is an essential adjunct, in an army, to perform functions, and precious little can be accomplished without it even with the best of initiative.

EDUCATIONAL QUALIFICATIONS OF VETERINARIANS.

The objection raised in former times against conferring rank on the veterinarian on account of insufficient education can no longer be maintained against him. He has outworked and outlived the inferior status and qualifications that some of his predecessors may have had before the Spanish-American War. Ever since that time the veterinarians themselves have jealously guarded the searching technical entrance examination prescribed under the Act of March 2, 1899. This examination extends over nine days, and is, to all intents and purposes, equal to that demanded of candidates for the commission of assistant surgeon and chaplain, and it is more comprehensive than that required

of dentists, who, after a novitiate in the army of only ten years, have now been given the commission of first lieutenant, while the veterinarian remains in the inferior status of the Law of March 2, 1899.

To banish all doubt on the question of education of veterinarians, we give below a list of the universities and veterinary colleges from which the present veterinarians have graduated:

One graduate of the Royal College of Veterinary Surgeons, London.

One graduate of the Royal Veterinary Academy, Berlin.

One graduate of McGill University.

One graduate of Harvard University.

Five graduates of Cornell University.

Five graduates of the University of Pennsylvania.

Four graduates of American Veterinary College, University of the City of New York.

Two graduates of Ohio State University.

Four graduates of the Vet. Dept., Iowa State Agricultural College.

Five graduates of Ontario Veterinary College.

Four graduates of Chicago Veterinary College.

One graduate of Kansas City Veterinary College.

Two graduates of San Francisco Veterinary College.

Graduates, 36; vacancies, 6; veterinarians of cavalry and artillery allowed by law, 42.

All these colleges are recognized colleges, inasmuch as they are compelled by state law, or by the rules governing the classification of veterinary colleges prescribed by the U. S. Department of Agriculture, to demand of their matriculants a satisfactory school education and a scientific curriculum of three or four years exclusively devoted to the study of veterinary medicine. In many instances this education is quite costly, and only young men of fairly well-to-do families can afford the outlay needed for such technical training. The educational standard of the present veterinarians of cavalry and artillery is, therefore, quite satisfactory, and fully equal to that possessed by the average army officer.

IMPROVEMENT THAT WOULD COME FROM THE CONSOLIDATION OF THE VETERINARY SERVICE.

If there is to be a competent veterinary service in our army, the first improvement necessary is to unite the veterinarians, now scattered among several army departments, into one technical

corps. Among the veterinarians enumerated in Section 1 of the bill are five veterinary inspectors of meats, who have been doing duty in the Subsistence Department since the reorganization of the army in 1901. They likewise are educated men, specialists in pathological anatomy and bacteriology, and general food experts. Their good work has been performed quietly, almost unknown to the army, yet appreciated by the Commissary General. No cry of "embalmed beef" has been heard in camp or garrison since their employment, because they have provided the soldier with healthful meats and meat products, thereby preventing certain diseases among the troops. The present civilian position of these meat inspectors is entirely unsatisfactory, and they should be commissioned officers to properly secure their services to the army.

The three remount stations are now provided for by the Quartermaster's Department with contract veterinarians; but if these new institutions are to develop properly and bear full fruit, only the best class of veterinarians, experts in the judging of the kind of horses desired by the army, should be secured for this detail. As in all other armies, they should be selected from the older veterinarians of cavalry or artillery, who have ripe experience, and as advisors and assistants to the purchasing officers should be responsible and commissioned veterinarians, and not civilians of questionable professional standing, who can have no proper knowledge of army needs.

The Army Service Schools at Forts Riley and Leavenworth are now provided with veterinary instructors and examiners by detail from three mounted regiments. This arrangement robs each of three organizations of one of their veterinarians, which is a just cause of complaint. Our regiments of nearly 1,200 horses have only two veterinarians, while, for instance, the German cavalry regiments of only 650 horses have four veterinary officers. None of our veterinarians can be spared from their regiments. Therefore the veterinary instructors and examiners should be specially provided for by law, as their services are greatly needed for the technical instruction of student officers, farriers and horseshoers in these army service schools, and in the bacteriological laboratory recently established at Fort Riley, Kansas.

The two actually new positions recommended in Section 1 of this bill are those of the Chief Veterinarian and the Purchasing Officer of Veterinary Supplies. These two new positions are

absolutely necessary to put the army veterinary service on a professional, effective and economic basis. Time and again have the army veterinarians requested that they be strengthened by a professional leader, who, at the same time, could be consulted directly by the War Department on the many technical and personal questions that constantly come up for consideration. These are now referred to and disposed of by bureau officers who are seldom fully acquainted with the real needs of the army veterinarian and of the army veterinary service. Because of this reason, more than from any other, has this branch of the service been treated with stepmotherly solicitude, and systematic improvement has been prevented or suppressed. It is therefore sincerely requested that this new position be finally established for the good that will come from it for the veterinary service and for the army at large. Among the seven (7) veterinarians with over fifteen years of service, who, under this bill, would be promoted to captaincies, one can readily be found to fill the position of Chief Veterinarian satisfactorily from the start.

Hardly less needed is the Purchasing Officer of Veterinary Supplies. The present system of purchase and delivery of veterinary supplies has always been unsatisfactory, defective and wasteful, because the work has not been in professional hands. It costs now twenty-five cents an animal to supply veterinary medicines, dressings and surgical instruments. With a competent Chief Veterinarian and Purchasing Officer of Veterinary Supplies going hand in hand, this item alone could be reduced to ten cents or even to five cents an animal, a saving that would not only pay for the expense of the new veterinary offices recommended, but leave a good balance to the credit of the Government. Further great savings, and improvement in the hygienic condition of public animals, would result from proper veterinary inspection of forage to prevent poisoning and indigestion among army horses; of horseshoeing to preserve their hoofs in normal shape and condition, and of saddlery and harnessing to prevent sores, all of which are at present attended to with the merest superficiality, occasioning many avoidable losses to the Government.

It is, therefore, with confidence that we recommend the approval of the several positions provided for in Section 1 of this bill, as the only means to create an army veterinary service worthy of its name and fulfilling its purpose.

The Reserve Veterinarians, recommended in Section 5 of the bill, are at present secured by contract by the Quartermaster

General. For years past the qualifications of these veterinarians have been of a lower standard than is permissible. This position is not attractive to qualified men because the position is temporary and pays only \$100 per month. Inasmuch as these men were not required to undergo an examination for entrance into the army, only such men applied as were deservedly failures in civil life. The number of contract veterinarians vary, but in 1900 there were about sixty of them employed in the Philippine Islands alone. Much complaint was heard about their incompetency, which was only to be expected, as many of them had neither studied nor graduated at a veterinary college, and charges of misconduct against them were frequent. Their services were of little value even in the treatment of the simplest and most ordinary diseases of horses and mules, and in the scientific and more serious work of checking contagious diseases they were wholly helpless, unreliable and costly employees of the Government. It is to the credit of the present Quartermaster General that he has attempted reform in this matter, and has instituted an entrance examination for this class of veterinarians which, though very easy, prevents imposters from joining the army. As these reserve veterinarians would be employed in greater numbers in case of war or other emergency, it is urgently recommended that their qualification, pay and status be raised to a more respectable standard, as provided for in Section 5 of this bill.

It needs to be stated here that the present bill is largely the outgrowth of a similar measure drafted by Major G. H. Cameron, 4th Cavalry, formerly Assistant Commandant of the Mounted Service School, Fort Riley, Kansas, and officially forwarded by him to the War Department on December 17, 1908. Major Cameron had made a comprehensive study of the foreign army veterinary services, and knew from long experience the shortcomings of our own. He had recommended, in the measure proposed by him, five veterinarians with the rank of major. Recently, officers of rank and experience have advised the reduction of this number to one, which advice has been followed.

The army veterinarians, finally, desire to assure the War Department and Congress that they do not intend to push themselves forward beyond the limits of a reasonable recognition of their services, nor beyond the limits of the proper professional standing which veterinarians should have in our army. They realize that in an army the military officer must rank first in importance and above all others, and that the representatives of

the other professions needed in the army must rank second or below him. But the present ineffective condition of the veterinary service must be shameful to every patriotic American, and should no longer be tolerated. It is high time that an intelligent, efficient and economic veterinary service be instituted in our army. This can be accomplished by giving the veterinarians a commission and the limited promotion recommended, which will surely be for the good of the mounted service, with which their work and duties are so closely identified. The number of veterinarians will never be great, therefore the cost of a veterinary corps will always be slight.

FOREIGN ARMY VETERINARY SERVICES.

Authentic information regarding the organization of the Veterinary Service of the foremost European armies has often been desired for comparison. In compliance, we cite below, in condensed form, the latest laws regulating the Veterinary Services of the British, German and French armies.

BRITISH ARMY.

(Copy in Extract.)

War Office, 9th October, 1903.

ROYAL WARRANT.

ARMY VETERINARY SERVICE.

EDWARD, R. I.—Whereas, we deem it expedient to amend the regulations relating to the promotion and pay of officers of our Army Veterinary Department:

Our will and pleasure is that the Warrant of her late Majesty, Queen Victoria, dated 26th October, 1900, shall be amended as follows:

RANK.

I. The substantive ranks of officers of our Army Veterinary Department shall be in future as follows:

Colonel, Lt. Colonel, Major, Captain and Lieutenant.

As Major-General:—the colonel holding the appointment of Director-General, Army Veterinary Department.

APPOINTMENT AND PROMOTION.

434. A Lieutenant shall be eligible for promotion to the rank of Captain on completing five years commissioned service, provided that he has previously qualified as may be prescribed by our Secretary of State.

435. A Captain shall be eligible for promotion to the rank of Major on completing ten years of service in the rank of Captain, provided that he has served three years abroad, and has previously qualified, etc.

436. Promotion to the rank of Lieutenant Colonel shall be made by selection from the rank of Majors, of not less than fifteen years service, who have served at least three years in India, and have previously qualified, etc.

437. Promotion to the rank of Colonel shall be made by selection from Lieutenant Colonels who have served five years in that rank.

BREVET-RANK.

438. An officer of our Army Veterinary Department shall be eligible for promotion to brevet-rank under conditions laid down in Article 36.

Instruction: Distinction in original investigation or research may, in the case of an officer of our Army Veterinary Department, be regarded as "distinguished service of an exceptional nature other than in field," within the meaning of Article 36.

PAY AND CHARGE PAY.

439. (We leave out the schedule of pay, half-pay, and retirement pays, as it is quite lengthy.)

CONDITIONS OF RETIREMENT ON ACCOUNT OF AGE.

586. The Director-General shall retire on completion of three years service as such. The retirement of Colonels shall be compulsory at the age of fifty-seven, of Lieutenant Colonels at the age of fifty-five and of Majors at the age of fifty-five.

CONDITIONS OF RETIREMENT ON ACCOUNT OF MEDICAL UNFITNESS.

588. An officer of our Army Veterinary Department shall be retired from our army at the expiration of five years from the date on which he was placed on the half-pay list on account of medical unfitness, or if reported by the medical authority to be permanently unfit for duty, at such earlier date as may be decided by our Secretary of State.

ARMY VETERINARY CORPS.

It is our further will and pleasure that the non-commissioned officers and men of the Army Veterinary Service shall be formed into a corps, to be designated the "Army Veterinary Corps," as follows:

Farrier-quartermaster-sergeant,
Staff-farrier-sergeant,
Farrier-sergeant,
Shoeing-smith-corporal,
Shoeing-smith,
Private.

Given at our Court, etc.,
By His Majesty's Command,
ST. JOHN BRODERICK,
ROBERTS, F. M.
Commander in Chief.

In accordance with the above warrant the "PERSONNEL OF THE ARMY VETERINARY DEPARTMENT" consists of:

(Uniform, Blue; Facings, Maroon-velvet.)

1 DIRECTOR-GENERAL, Army Veterinary Department, in War Office.

2 COLONELS: Principal Veterinary Officers, on detail with General Staff and Remount Service.

10 Lt. COLONELS—

One in War Office, Deputy Director-General, Army Veterinary Department.

6 Principal Veterinary Officers at Headquarters of Army Corps.

3 Inspecting Veterinary Officers in India.

23 MAJORS—

21 Inspecting Veterinary Officers in Great Britain, India, South Africa and Egypt.
 One, in Remount Department, War Office.
 One, Instructor at Army Veterinary School, Aldershot.

47 CAPTAINS—

38 at Regimental Headquarters.
 6 with Remount Depots in India.
 2 Instructors at Army Veterinary School, Aldershot.

60 LIEUTENANTS—

57 Serving with regiments.
 3 Assistants in Remount Depots.
 4 as Inspectors of Meats.
 10 on probation at Aldershot.

143 Veterinary Officers.

Besides the regular British Army Veterinary Department, there are authorized Territorial Army Veterinary Corps for Canada, Australia, etc. They consist of permanent Veterinary Corps and Veterinary Corps for active militia. Veterinarians entering these Corps must pass qualifying examinations one year after their appointment when they are commissioned to these Corps.

Candidates for the regular Army Veterinary Service must be British Veterinary graduates and pass an entrance examination as prescribed by the Director General, Army Veterinary Department. The successful candidates are detailed for attendance at the "Army Veterinary School, Aldershot," where they receive a course of instruction in equitation, in military horseshoeing, in the use of equipments and appliances for Veterinary field service, and in military law and regulations. Advanced courses for Veterinary Officers are periodically given at the same Army School, in preparation for promotion.

GERMAN ARMY.

(Armee Veterinaer Ordnung.)

Passed the Reichstag March 17, 1910.

(Copy in translation.)

ARMY VETERINARY ORGANIZATION.

Article I.—*Need of Veterinarians, General Duties, Supervision, Inspection.*

1. The technical services of Veterinary Officers are of great importance in the preparedness of the Army for War, particularly in preserving the health and marching capacity of horses and in the prevention and suppression of epidemics or other devastating diseases.

2. The Veterinary service of the line comprises the enforcement of Veterinary Hygiene, the Veterinary treatment, the horseshoeing, and the instruction of officers and men in hippology. Appointments are made for duties at the Military Veterinary Academy, the horseshoers schools, the remount stations, the depots for Veterinary stores for mobilization, and for administrative purposes.

3. The whole Veterinary service is under the direction of the General War Department.

4. The inspection is performed by the Veterinary Inspector General who has the rank of Colonel. He is the superior of all Veterinarians serving with the line and of the personnel detailed at the inspection bureau. On technical questions he can request special reports of Veterinary Officers attached to the Staff of Commanding Generals, or of the Professors of the Military Veterinary Academy.

5. The Veterinary Inspector General visits the various garrisons about once in two years. In these inspections he investigates the condition of the Veterinary service, the local regulations prescribed for controlling epidemics, the stable hygiene, the horseshoeing, the preparation of Veterinary records, the administration of Veterinary hospitals, the feeding and food, the meat inspection, the condition of Veterinary War Stores, etc. In these inspections he is not authorized to give orders regarding the Veterinary Service.

Article II.—Rank, Service with the Troops, Institutions.

The Veterinarians of the Army consist of—

1. Veterinary Officers. (Active).
2. Probationary Veterinarians. (Detached).
3. Reserve Veterinarians. (In civil life, with previous military training and subject to order.)

The grades of rank of Officers of the Veterinary Corps are—

1. Veterinary General (General Veterinaer) with the rank of Colonel.
2. Corps—Veterinarian (Corps stabs Veterinaer) with the rank of Major; a Corps-Veterinarian serving as assistant to the Veterinary General, ranks as Lieutenant Colonel.
3. Senior Staff Veterinarian (Oberstabs Veterinaer) with the rank as characterized Major.
4. Staff Veterinarian with the rank of Captain.
5. Senior Veterinarians (Ober Veterinaer) with the rank of 1st Lieutenant.
6. Junior Veterinarians with the rank of 2d Lieutenant.

Probationary Veterinarians and one-year-volunteer Veterinarians rank with cadets before the sergeant majors.

SERVICE WITH THE TROOPS.

62. The Veterinary Officers Corps stands next (neben) to the Officers Corps of the Army as regards rights and duties. Within the veterinary corps prevail the same rules regulating rank and precedent as apply to Army officers. Veterinary officers do not assume command of officers of the Army. Whether Veterinary officers are under the command of military officers depends upon their official position (A. R. 66).

63. Veterinary officers of a higher grade are the superiors of those of the lower grades. The Corps-veterinarian is the superior of the Veterinarians of the Army Corps; the Regimental Veterinarian is the superior of the Veterinarians of a regiment. Between Veterinary Officers of the same grade precedence is regulated by date of commission, unless one becomes the superior of others by special order.

64. Veterinary Officers are the superiors of all enlisted men; the probationary veterinarians and one-year-veterinary-volunteers are the superior of horseshoers and privates only.

65. The rules of respect and salute prescribed for medical officers apply equally to Veterinary Officers.

66. Veterinary Officers of the line belong to the Staff of their regiments. If attached to a separate battalion, train, machine-gun company or detached troop, they are under command of their Regimental Commander and of the officer commanding the organization.

69. Veterinarians report to the commanding officers of organizations such treatment as appears necessary, subject to special wishes from the military point of view. If an officer, responsible for horses, objects to proposed veterinary treatment, the Veterinarian concerned reports to the Regimental Veterinarian, who shall bring the matter before the Regimental Commander for decision. As regards execution of treatment, that is, the prescription of medicines, surgical operation, direction for nursing, etc., a Veterinarian is responsible only to his superior Veterinarian.

70. The course of treatment pursued by Veterinarians is to be based on approved scientific procedure. New lines of treatment, or such as necessitate a longer time on the sick list, require also the consent of the commanding officer of the organization. Treatment necessary to save the life of a horse, or prompt treatment in field service, is undertaken, at all times, under the personal responsibility of the Veterinarian.

71. The treatment of the more serious diseases is to be carried out in the garrison veterinary hospital, or in the field veterinary hospitals, established during maneuvers or war. Troops must be left unincumbered by unfit horses. The duties of enlisted men detailed at Veterinary Hospitals are arranged by the Veterinary Officer in charge with the approval of his Commanding Officer.

72. Other duties of the Veterinarians of the line are—

1. The dispensing of veterinary medicines, and the purchase of instruments, veterinary supplies, horseshoes and tools.
2. The examination of forage, saddlery and harnessing.
3. The examination of cattle for slaughter and of meats for army consumption.
4. Post-mortem examinations.
5. Rendering of veterinary reports.
6. Veterinary instruction of officers, supply officials, non-commissioned officers, one-year-veterinary-volunteers, and horseshoers.

7. Special reports on claims of damage of civilians for horses drafted in maneuvers and in war; of spoiled forage; of spoiled meats; selection of sites for building of stables and veterinary hospitals, and such other technical questions as may arise involving the army.

76. The Corps Veterinarian is the technical advisor of the Commanding General of an Army Corps, and he attends to all matters pertaining to the veterinary service of the corps. On his own initiative he recommends such actions as he deems necessary within his sphere of duty.

84. The Regimental Veterinarian superintends the veterinary service of the regiment; he is the technical advisor of the Regimental Commander and he is at his disposal for any special veterinary service. He is to be thoroughly posted on the health and marching condition of the horses of the regiment, and has special charge of the work and instruction of horseshoers. The Regimental Commander can excuse him from personal treatment of sick horses.

PROMOTION, MARRIAGE, EQUIPMENT, RETIREMENT.

90. The promotion of Senior Veterinarians to Staff Veterinarians is dependent upon an examination following a course of six months at the Military Veterinary Academy. If a Senior Veterinarian fails in one or two subjects, he can repeat that part within one month without cost accruing to the Government.

91. A four months advanced course for Staff Veterinarians is given periodically as deemed necessary.

92. A two months special course for Corps Veterinarians is given as needed for the demonstration of new lines of treatment, new equipment or appliances for veterinary field service.

105. Veterinary Officers who wish to marry need the consent of His Majesty. The request has to be favorably endorsed by the Staff Veterinarian and the Regimental Commander.

107. The requirements for clothing and equipment of officers apply also to Veterinary Officers. Probationary Veterinarians are mounted by their organization.

112. The officers retirement law of 5/31, 1906, applies to Veterinary Officers.

113. The pension law for dependents of deceased Officers of 5/17, 1907, applies to Veterinary Officers.

AUGMENTATION OF THE VETERINARY OFFICERS CORPS.

The Corps recruit itself from:

1. Probationary Veterinarians, graduates of the Military Veterinary Academy.

2. Civilian Veterinarians who have served as one-year-volunteer-veterinarians and who wish to remain in active service.

The requirements for admission to the Military Veterinary Academy are: Certificate of physical capacity for military service; age not over twenty-one years; diploma of graduation from a classical school (gymnasium); honorable position of father in the army or civil life; agreement of terms of service; applications to be forwarded to the Veterinary General.

NOTE.—Upon the Veterinary Officer devolve high moral, physical and technical demands in peace and war. Only such young men are to be selected for the military veterinary career who possess a high mind, tact, mental versatility, physical activity and pride in their profession. (Margin note of His Majesty on the original draft of the bill.)

INSTITUTIONS.

(Now follow rules and regulations for the administration of the Military Veterinary Academy, together with schedules concerning the training of veterinary cadets until graduation, not applicable to conditions in the United States except perhaps the following paragraph):

40. The Military Veterinary Academy has a special laboratory for such hygienic and bacteriological examinations as relate to the veterinary service. Troops request the examination of forage, meats, blood-serum, post-mortem organs, etc., by forwarding samples direct to the laboratory.

The foregoing law went into effect April 1, 1910. The etat for the Prussian Army for 1910 allows: One Veterinary General, 25 Corps Veterinarians, 257 Senior Staff Veterinarians, 114 Staff Veterinarians, 168 Senior and Junior Veterinarians; total, 565 Veterinary Officers.

DISTRIBUTION OF VETERINARY OFFICERS.

(Uniform: Blue, facing black and maroon.)

WAR MINISTRY.

1 Veterinary General, Director of the Military Veterinary Academy.
1 Corps Veterinarian, Chief of Technical Veterinary Section.

ARMY SERVICE SCHOOLS.

9 Veterinary Officers of various ranks: Instructors at the Military Veterinary Academy.

2 Veterinary Officers, at the Army Veterinary Bacteriological Laboratory.

16 Senior Veterinarians, Instructors at the six Army Horseshoers Schools.

3 Staff Veterinarians, Instructors at the Military Riding Schools.

HEADQUARTERS OF ARMY CORPS.

19 Corps Veterinarians, Chief Veterinarians of Army Corps.

ATTACHED TO THE LINE.

474 Veterinary Officers with the Regiments of Cavalry, Artillery, Engineer Battalions, Train Battalions and Signal Corps.

SPECIAL DETAILS.

26 Veterinary Officers, at the eighteen Remount Depots.

8 Veterinary Officers, at Mobilization Stores.

6 Veterinary Officers, Inspectors of Meats and Canning Factories.

565 Veterinary Officers.

The Probationary Veterinarians are not officers, and their number varies. The Reserve Veterinarians number about 500, and they become officers on mobilization. The other contingents of the German Army, those of Bavaria, Saxony and Wurtemburg have smaller Veterinary Corps organized after the pattern of the Prussian Army.

Before entering the Military Veterinary Academy, veterinary candidates must serve six months as volunteers in a mounted arm. The discipline at the Academy is military, the cadets wearing a uniform. After graduation from the Academy, the young men enter the Army as Probationary Veterinarians, in which position they remain for six months or until vacancies occur in the Veterinary Officers Corps. The election of Probationary Veterinarians to Veterinary Officers takes place by ballot of the Veterinarians of the Army Corps. If they are rejected, they must remain on probation or they can resign from active service.

The regulations for the Army Veterinary service are very strict. The results obtained by this service are excellent, and it is estimated that its cost is only one-twentieth of the value of its savings to the Army.

FRENCH ARMY.

Article V. of the Organization of the French Army, approved December 13, 1902, fixes the strength of the Veterinary Department as follows:

VETERINARIANS.	NUMBER.	RANK.
Principal Veterinarian, I Class.....	1	Colonel
Principal Veterinarian, II Class.....	14	Lieutenant Colonel
Veterinary Majors	42	Chief of Squadron
Veterinarians, I Class.....	184	Captain
Veterinarians, II Class.....	226	Lieutenant or Sub-Lieutenant
Veterinary Aides	variable	Commissioned Veterinarians

DISTRIBUTION OF VETERINARIANS

(Uniform: Blue, facings maroon.)

WAR MINISTRY.

- 1 Principal Veterinarian, I Class, Chief of Technical Veterinary Section.
- 1 Veterinary Major, member.
- 1 Veterinarian, I Class, member.

SCHOOL OF APPLICATION OF THE VETERINARY SERVICE, SAUMUR.

- 1 Veterinary Major, director.
- 1 Veterinarian, I Class, Chief of Veterinary Clinic and Hippology.
- 1 Veterinarian, I Class, professor of Pathology and Military Law.
- 1 Veterinarian, II Class, professor of Bacteriology and Tropical Diseases.
- 1 Veterinarian, II Class, professor of Horseshoeing and Saddlery.

HEADQUARTERS OF ARMY CORPS.

- 14 Principal Veterinarians, II Class, Chief Veterinarians.

ATTACHED TO THE LINE.

- 146 Veterinarians, Field and Mountain Artillery.
- 8 Veterinarians, Colonial Artillery.
- 229 Veterinarians, Home Cavalry Regiments.
- 10 Veterinarians, Colonial Cavalry.
- 8 Veterinarians, Engineer Battalions.
- 14 Veterinarians, Train Battalions.
- 27 Veterinarians, Remount Depots.
- 2 Veterinarians, War School.
- 1 Veterinarian, Chief of Military Abbatoir.

467 Commissioned Veterinarians.

The candidates for the Veterinary Service must be graduates of one of the three Government veterinary schools, and on passing a satisfactory physical examination, are accepted as "aides vétérinaires," and ordered for a course of instruction at the Cavalry School at Saumur, which is about the same in extent and character as that at Aldershot in England. They are then attached to the Regiments, or detailed at Remount Depots, Veterinary Depots, Military Abbatoirs, etc., as needed.

Independent of the Veterinary Corps there exists a "commission d'hygiène hippique," which consists of one Division General (President), one Brigadier General, one Colonel and three Principal Veterinarians, the duty of which is to investigate all conditions and recommendations pertaining to the preservation of the health of army horses. This commission issues from time to time a report entitled "Recueil des mémoires et observations sur l'hygiène et la médecine vétérinaire militaire."

All other armies of Europe have Veterinary Corps, organized on the same lines as those of Great Britain, Germany and France. In the Orient, the Japanese Army has a fully equipped Veterinary Corps after the British pattern. The U. S. Army is the only civilized Army in the world that has no Veterinary Corps and that continues to conduct the affairs of this department along experimental lines employed in European armies between the years 1765 to about 1823.

REPORT OF SPECIAL COMMITTEE ON INSULAR POSSESSIONS (A. V. M. A.).

BY N. S. MAYO, CHAIRMAN.

The United States of America has acquired colonies, or "insular possessions," without having made adequate preparations for the administration of the same. The results from a veterinary point of view have been far from satisfactory. In the Philippines the ravages caused by rinderpest and surra have been disastrous. The economic loss has been great, but the lack of method and knowledge in controlling rinderpest has seriously hindered the pacification of those islands as well as retarding the progress of agriculture and allied interests. Ten years after the islands came under our control we were establishing a suitable quarantine station that should have been one of the first things to be done. In the meantime we have trained a few veterinarians in the long, hard school of experience to deal with tropical animal diseases in an intelligent manner.

At present there is small inducement for a well educated and trained veterinarian to enter the insular service except for the novelty and experience. The pay is not large; living expenses are high and one soon gets out of touch with his friends and profession in the United States. Promotion is slow and there is little of it. The risks to life and health are considerably greater than in this country and there is no retirement or pension if the "grim destroyer" fever "gets" you. More than all this are the local political influences ever at work to nullify and destroy every effort put forth, no matter how meritorious it may be. As our insular possessions are administered by the War Department, it is evident that the insular veterinarians should belong to the army. What is needed is a well-organized army veterinary corps. The members of this corps should be young men of strict integrity, high ideals, thoroughly trained in their profession and particularly in regard to tropical diseases of animals, and they should also have one modern language. As our foreign relations will probably be intimately associated with Latin-American countries, Spanish would be preferable. With a veterinary corps trained as indicated, they would enter a country with our army prepared to take proper measures for the protection of the army horses and also the live stock of the occupied country against transmissible diseases. Quarantine measures could be immediately put in force, vaccinating and immunizing stations estab-

lished. After the need for an army has passed, the veterinarian would be able to remain and the country would still have the benefit of expert services.

With an army veterinary corps there would be definite central supervision, and the veterinarian would be free from petty local politics that is fatal to efficient work. He would be entitled to pension for disability contracted in the service and, should he live the allotted time, retired pay. He would have his foreign tour as well as service at home. This, I believe, would give us a creditable veterinary service that would be efficient and economical and would demonstrate to the inhabitants of our insular possessions that the government of the United States of America is really interested in protecting their flocks and herds that are so important to material prosperity and to peace.

THE FORTY-NINTH ANNUAL MEETING OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION will be held in Indianapolis, Ind., August 26, 27, 28, 29 and 30, 1912. Indianapolis is a capital city of about 200,000 inhabitants. It is centrally located and easily accessible to all parts of North America. The hotel accommodations are unexcelled. The Commercial Club has joined with the veterinarians of Indiana in extending a royal "Hoosier" welcome to our association.

The local Committee of Arrangements has already been organized and much of the preliminary work finished. The committee is made up as follows: Dr. G. H. Roberts, chairman, O. L. Boor, J. W. Klotz, F. A. Bolser, F. A. Mueller, W. B. Craig, R. A. Craig, J. C. Rodger, W. J. Armour, T. A. Sigler, C. I. Fleming, Wm. F. Myers, J. L. Axby and E. M. Bronson.

The Claypool Hotel has been selected as the headquarters. It is centrally located at Washington and Illinois streets, about five minutes' walk from the Union Station. "Das Deutsche Haus," a German clubhouse, has been selected as the meeting place. It is located at New Jersey and Massachusetts avenues, about ten minutes' walk from the hotel headquarters. The main meeting hall will seat 1,600 people. There are two other halls in the building, suitable for section work, and several smaller rooms that can be used for committee meetings. Lunch will be served each day of the meeting in the basement. The annual banquet will be held on Thursday evening, August 29, in the auditorium.

The Clinics will be held in the large operating room of the Indiana Veterinary College.

SOCIETY MEETINGS

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

OCTOBER MEETING.

The regular monthly meeting of this association was called to order by the president, Dr. W. Reid Blair, in the lecture room of the New York-American Veterinary College at 8.40 p. m.

The minutes of the June meeting were read and approved.

The secretary presented, through the courtesy of the owner, an odd case of glandular enlargement in a dog. This condition was first noticed in the early part of July and the glands of the throat, especially the parotid and thyroid, were the first involved, causing difficult respiration and interfering with the animal obtaining rest and sleep.

This condition of enlargement had spread to about all of the superficial glands of the body, including the submaxillary, prescapular, mammary, inguinal, etc. All of which could be plainly seen or felt on examination.

The animal in question was a cross-bred fox terrier weighing about 25 pounds in good condition and always had had excellent care.

Treatment had consisted chiefly of the iodides of arsenic and potash, with some relief of the throat symptoms.

This animal was examined with much interest by the members and visitors present.

Delegates and members who attended the A. V. M. A. meeting at Toronto, Canada, gave interesting reports of the same. Among those who reported having attended the meeting were Drs. Geo. H. Berns, D. W. Cochran, R. W. Ellis, T. E. Smith, E. B. Ackerman, W. Reid Blair and R. S. MacKellar.

Several members also reported having attended the state society meeting in Brooklyn.

Dr. Gannett, one of the delegates, gave an interesting report of this meeting, especially the clinics.

Dr. Geo. Berns reported on the cases operated on, and stated that the roarer operated on was doing nicely.

Dr. Jamieson stated that his case that was trephined was also doing well.

Dr. Ellis reported on an obscure case of lameness in which a number of the members differed as to diagnosis.

The "Question Box" contained the following question: "If in a herd of ten cows, two are tubercular, would the removal of *one* reduce the contagion 50 per cent.?" The consensus of opinion was that it would not.

Dr. Blair exhibited and explained an interesting photo of the heart of an ostrich, showing some peculiar pathological conditions.

Dr. Thos. Sherwood's death was reported, and Drs. Berns, Ellis and Kingston were appointed as a committee to draft suitable resolutions.

Dr. Berns invited the members to attend an operation on a roarer (Williams' method), Friday evening, October 6, and assured all that they would be welcome.

Dr. N. Peyser, of Corona, L. I., was elected to membership.

Dr. Ackerman urged that each member bring a fellow practitioner to the next meeting.

Meeting adjourned.

R. S. MACKELLAR, Secretary.

NOVEMBER MEETING.

The regular meeting of the Veterinary Medical Association of New York City was called to order by President Blair, in the lecture room of the New York-American Veterinary College at 8.45 p. m., November 1.

The minutes of the October meeting were read and approved.

Dr. P. V. Weaver, of Glen Cove, L. I., read an interesting and practical paper on the "Treatment of Parturient Apoplexy." This paper created a profitable discussion, which was entered into by a number of the members present.

Dr. Weaver suggested that the success of the treatment of parturient apoplexy ought to stimulate us to try and find a specific treatment for azoturia.

Dr. C. E. Clayton, of New York City, gave an interesting case report, entitled "A Case Not Labeled."

This case was one of a coach horse that while being driven one day suddenly stopped, crowded to the right side against the pole and refused to move. Was unhitched, led to stable, when it was found that he had a temperature of 102° F., pulse 45 and inclined to be hard. Diagnosed as a case of staggers and gave a physic which operated well on the second and third days. On the fourth day animal's condition seemed to be entirely normal. The night of the fifth day the horse became excited and violent and kept bearing over continually to the right and to such an extent that before being restrained he had broken down two stalls. Showing decided symptoms of acute brain trouble he was destroyed and the brain removed. On examination it was found that the left ventricle contained a hard tumor and the right a softer jelly-like mass, probably of more recent origin. Dr. Clayton exhibited the brain, which was examined with much interest by the members and visitors present.

Dr. C. Rohrer gave an interesting case report of a "Ruptured Diaphragm in a Dog."

This dog was a cross-bred Boston terrier, which on December 16, 1910, was run over by an automobile. Examination failed to show any broken bones, but the animal was weak and internal injuries were suspected. Stimulant treatment given and next day seemed to be doing well. Called again on January 4, 1911, and found the dog to be affected by dizziness after meals. Reported doing well up to February 20, 1911, when death suddenly occurred. Postmortem disclosed a rupture of the diaphragm extending diagonally about $2\frac{1}{2}$ inches in length. The stomach and small lobe of the liver were forced through this opening into the thoracic cavity.

Dr. McCully, of New York City, stated that the examination of the specimens taken from the polo pony exhibited at the state meeting in Brooklyn was negative. Dr. Clayton stated that the postmortem of this case showed the lungs to be normal and finely developed, spleen large, kidneys large, ovaries large and hardened. The heart walls were thickened and the trouble was probably located in the valves of the heart, causing circulatory interference.

Dr. McCarthy reported a case of polypi in a horse which had been operated on in June, 1910, for this same condition at a clinic of this association. This animal was condemned and killed as being glandered, and polypi were found to have again completely filled the nasal passages.

Dr. Stearns brought up the point of inter-state jurisdiction in tuberculin testing, which created an interesting discussion.

Dr. Glennon, of Newark, N. J., presented a clipping from a Newark paper in which the Jersey dairymen condemn tuberculin.

The house surgeons of the New York-American Veterinary College presented a large St. Bernard dog for examination. This animal had been injured in a street accident and showed peculiar lameness of a hind limb. Several of the members examined the dog and all agreed that it was a case of stifle lameness with a probable partial crural paralysis. Stimulating liniments and *nux vomica* were suggested as probably the best treatment.

Dr. J. J. Foy, of New York City, stated that he had recently had seventeen cases of socalled forage poisoning, twelve of which died. Dr. D. Cochran stated that in his opinion the cases were simply spinal meningitis. Dr. Stearns stated that in medical practice a similar condition is known as a *toxic neuritis*. This statement created an interesting discussion.

The "Question Box" contained the query "Are poly bacteria of veal or imaginary value in suppurative conditions?"

In answer to this some of the members claimed to have obtained good results and others negative.

It was unanimously decided to again hold a "Smoker," which has become an annual affair of this association, to which the members and their friends look forward with pleasure. The Smoker Committee of last year were instructed to make arrangements for this social event.

A donation of twenty-five dollars was unanimously voted toward the monument fund of Prof. S. Arloing.

A vote of thanks was tendered the contributors to the program of the evening.

Meeting adjourned.

R. S. MACELLAR, Secretary.

DECEMBER MEETING.

The regular annual meeting of this association was called to order by President Blair at 8.45 p. m.

Minutes of the November meeting were read and approved.

Dr. Clayton, chairman of the Smoker Committee, reported that the committee expected to have all arrangements for the annual smoker completed very soon.

Dr. W. J. McKinney, of Brooklyn, made an interesting case report of a riding and driving mare, used by a lady, which on being called to see it, he found to be vicious and difficult to approach to make an examination. She was standing on the toes of both hind feet and he supposed her to be spavined. Decided to fire and blister and cast animal to do so. On being released after operation she could not get up. Heart was weak, so gave strychnine, sulp. gr. I., made her comfortable and left her for the night. Second day gave zii. aloin. Mare also had quite a profuse hemorrhage. On third day mare was up and viciousness had left her. This returned again in a few days and she would strike and bite if approached. At the end of two weeks she was down again, had another hemorrhage, got up and viciousness again left her. Now at the expiration of a month she is doing well.

The second case reported by Dr. McKinney was one of impaction which had resisted treatment for several days. Had been given two cathartic boluses, one quart of oil, eserine and strychnine twice, together with enemas.

The animal was then punctured with a new model trocar and $\frac{1}{2}$ gallon of oil and saline solution injected into the bowels through the canula. Next day a free movement of the bowels took place and the animal made a good recovery.

Discussed by several members.

Dr. Clayton described a case of paralysis of the bowels in which all remedies failed in producing any action of the same. On postmortem the bowel contents were found to be in a liquid condition, so as the Doctor expressed it, if the animal had been strung up by the neck the contents ought to have emptied by gravitation.

Dr. Greissman also described a prolonged case of impaction which finally succumbed on the tenth day.

Dr. Blair made an interesting case report on "Tuberculosis in a Dog."

This animal was a bull terrier, three years old, weighing 60 pounds. Had a fight with a collie in April, followed by fainting spells. May 4, served a bitch and began to lose weight; developed pleurisy, which was treated with good results. Six weeks later again acting "off" fainting spells but appetite normal, unusual pulse.

Filari suspected but examination of blood failed to show this condition.

Anaemic—Improved on strychnine and arsenic, but had an attack of diarrhoea but no blood passed and examination failed to show intestinal parasites, lungs congested.

This dog was exhibited at the state meeting in Brooklyn and diagnosed to have dropsy and heart lesions.

Latter part of October was examined again and found to be so emaciated that the liver could be plainly felt through the abdominal wall and nodules on the same plainly distinguished, which justified the diagnosis of a probable case of tuberculosis.

On November 7 the animal was chloroformed and post-mortem showed the heart flabby, right lung congested, and numerous milliary tubercle, bronchial and mediastinal glands caseous. Liver weighed five pounds and had large tubercular lesions. Kidney also showed some milliary tubercles, spleen normal in weight with small milliary tubercles on the edge. Stomach catarrhal, large intestine contained milliary tubercles and ulcerated patches.

Examination of the tissues proved positively that tuberculosis was present, even showing deposits on valves of heart, which undoubtedly caused the peculiar heart action.

Dr. Blair exhibited the heart, lungs and liver, which were examined by all present with much interest.

Dr. McLaughlin described an odd case of long standing lameness in a dog.

The committee on resolutions on the death of Dr. Sherwood, offered the following:

Whereas, It has pleased Almighty God to remove from our midst Dr. T. G. Sherwood, a valued member of this association, and realizing the loss not only to ourselves, but to the profession, therefore be it

Resolved, That we, a committee representing the Veterinary Medical Association of New York City, do deeply deplore his loss; his amiability and sincerity having endeared him to all with whom he came in contact and, be it further

Resolved, That we offer to his family our heartfelt sympathy and that a copy of these resolutions be spread on the minutes of this association, and also a copy forwarded to the family of the deceased.

Signed,

GEO. H. BURNS,
R. H. KINGSTON,
R. W. ELLIS.

The annual report of the secretary and treasurer was submitted and accepted.

The election of officers for the ensuing year resulted as follows:

President, Geo. H. Berns; vice-president, R. H. Kingston; secretary and treasurer, R. S. MacKellar.

Dr. Griesmann promised a case report for the next meeting.
Adjourned.

R. S. MACKELLAR, Secretary.

CENTRAL NEW YORK VETERINARY MEDICAL ASSOCIATION.

The second semi-annual meeting of the Central New York Veterinary Medical Association was held at the Vanderbilt Hotel, Syracuse, New York, on November 28, 1911, with the following members present: W. G. Hollingworth, H. A. Turner, W. B. Switzer, J. G. Hill, J. A. Pendergast, E. E. Dooling, J. M. Currie, A. J. Tuxill, R. M. Weightman, J. C. Stevens, C. R. Baldwin, F. E. York, J. S. Elliott, Wilson Huff, Frank Morrow, J. H. Stack and E. D. Hayden. Applications for membership were presented by J. Vincent Townsend, Earl W. Fitch and George D. Burton, and all were duly admitted. The association had as its guests Dr. P. A. Fish, of the New York State Veterinary College; Dr. J. F. DeVine, President of the New York State Veterinary Society, and Dr. J. H. Taylor, President of the Genesee Valley Veterinary Medical Society.

Among the matters taken up at this meeting, perhaps the most important was a discussion of the bill now before Congress to consolidate and increase the efficiency of the veterinary service in the United States Army. This measure was unanimously approved and each member was requested to solicit the support of their senators and assemblymen therefor.

The question of illegal practice was discussed, after which the Committee on Resolutions presented the following:

Whereas, There are, scattered throughout the state, men who are posing as veterinarians and, by their lack of professional training or dishonorable principles, or both, are imposing upon the public and holding veterinary service in disgrace,

Be it Resolved, That this association appoint a prosecuting committee whose duty it shall be to employ counsel and take such

action as the facts in each case of illegal practice brought to their attention shall warrant under the statute of the State of New York in reference to the illegal practice of veterinary medicine and surgery.

(Signed) E. E. DOOLING,
J. C. STEVENS,
J. M. CURRIE,
Committee.

This resolution was adopted and the following committee was appointed: Dr. E. E. Dooling, Dr. J. C. Stevens, Dr. A. J. Tuxill, Dr. J. G. Hill and Dr. J. M. Currie. Dr. Dooling, as chairman of the Prosecuting Committee, later announced the selection of Merritt A. Switzer, of Oswego, N. Y., as attorney for the committee. It was decided to enter upon a vigorous campaign against illegality of practice and to that end each member of the association was requested to report to the secretary cases of this kind in their territory, and the secretary was directed to report these names to the association's attorney. Under the plan as proposed the attorney will then correspond with the men reported, giving them an opportunity to desist. In the event that this notice is disregarded, it will then be the duty of the attorney to prosecute; acting under the advice and with the assistance of the Prosecuting Committee.

The literary program of the meeting was both interesting and helpful. Dr. DeVine gave a very helpful paper on "Association Work," emphasizing the rise of the profession and the necessity of maintaining high professional standards. Particularly did he denounce the practice which was but a few years ago quite common—of feeing the grooms and coachmen of the wealthy stable owner as a means to secure his patronage. Dr. Hollingsworth gave an interesting paper on "Sanitation; Meat, Milk and Dairy Inspection." "The Horse is Here to Stay" was the title of a paper given by Dr. Stevens. Dr. Baldwin, under title "Rabies in Cattle," gave his experiences and observations on five or six cases of that disease which he had personally met in practice. Dr. Morrow reviewed some very interesting cases, among them some peculiar forms of azoturia, under the title "Cases We Sometimes Meet in Country Practice." The last paper, on "Mammitis," was presented by Dr. Weightman. All drew forth good discussions and proved valuable contributions to the benefits of the association to its members.

Particular credit for the success and interest of the meeting is due to the presence and co-operation of the visitors who were in attendance. Their broad experience and differing viewpoint gave to their timely remarks on the different subjects under discussion weight and the quality of helpfulness. To them the association extends its hearty thanks.

W. B. SWITZER, Secretary.

YORK COUNTY VETERINARY MEDICAL ASSOCIATION.

The quarterly meeting of the above association was held in the city of York, Pa., on Tuesday, December 5, and was the largest attended meeting of that organization in some time. Dr. C. J. Marshall, Secretary of the American Veterinary Medical Association and State Veterinarian of Pennsylvania, was the guest of the association on this occasion, and addressed its members on "Dairy and Milk Inspection, and the Necessity of Cleanliness in Order to Secure Proper Returns." Much valuable information was imparted by the doctor during his address, and he was given a vote of thanks at the conclusion of his remarks.

"Contagious and Infectious Diseases of Animals" was the topic of discussion by the members of the association.

E. S. BAUSTICKER, Secretary.

THE Veterinary Medical Association of New York City honored itself in electing Dr. George H. Berns, of Brooklyn, its president at the December meeting.

DR. W. H. GRIBBLE, of Washington Court House, Ohio, and his family, traveled four thousand miles in their automobile the past summer, touring for pleasure. On their return, the neighbors of the good doctor found it difficult to determine whether his enthusiasm was greater over New York state's good roads and the beautiful scenery, or the accomplishments of his 30-horse-power "Elmore."

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary
Alumni Ass'n, N. Y.-A. V. C.	Week Aug. 26, '12	141 W. 54th St. Indianapolis.	J. F. Carey, East Orange, N.J.
American V. M. Ass'n		Lec. Room, La- val Un'y, Mon.	C. J. Marshall, Philadelphia.
Arkansas Veterinary Ass'n	1st and 3d Thur. of each month	Chicago	J. B. Arthur, Russellville.
Ass'n Médécale Veterinaire Fran- çaise "Laval"	2d Fri. ea. mo.	S. Omaha, Neb.	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago	3d Mon. ea. mo.	San Francisco	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha		Ottawa	E. J. Jackson, So. Omaha.
California State V. M. Ass'n	June and Nov.	Syracuse	J. J. Hogarty, Oakland.
Central Canada V. Ass'n	2d Tues. ea. mo.	Chicago	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n	Jan. 18-19, 1912.	Denver	W. B. Switzer, Oswego.
Chicago Veterinary Society	Feb. 6, 1912.	Hartford	D. M. Campbell Chicago.
Colorado State V. M. Ass'n	3d Mon. ea. mo.	Newark, N. J.	B. F. Kaupp, Ft. Collins.
Connecticut V. M. Ass'n		Atlanta	B. K. Dow, Willimantic.
Essex Co. (N. J.) V. M. A.	Dec. 21-22, 1911.	Boise	J. F. Carey, East Orange, N.J.
Genesee Valley V. M. Ass'n		Chicago	J. H. Taylor, Henrietta.
Georgia State V. M. A.		Indianapolis	P. F. Bahnsen, Americus.
Hamilton Co. (Ohio) V. A.	Oct. 10-12, 1911.	M. hattan	Louis P. Cook, Cincinnati.
Idaho Ass'n of Vet. Graduates	Dec. 7-8, 1911.	Lexington	G. E. Noble, Boise.
Illinois State V. M. Ass'n	Jan. 10-11, 1912.	Portland	L. A. Merillat, Chicago.
Indiana Veterinary Association		Baltimore	E. M. Bronson, Hartford City
Iowa Veterinary Ass'n	Dec. 28-29, 1911.	Boston	C. H. Stange, Ames.
Kansas State V. M. Ass'n	Oct. & Feb. ea. yr.	Mich. Agr. Col.	B. Rogers, Manhattan.
Kentucky V. M. Ass'n		St. Paul	Robert Graham, Lexington.
Keystone V. M. Ass'n	Jan. 10-12, 1912.		E. H. Yunker, Phila.
Louisiana State V. M. Ass'n			E. P. Flower, Baton Rouge.
Maine Vet. Med. Ass'n	Jan. 30-31, Feb.		C. W. Watson, Brunswick.
Maryland State Vet. Society	1, 1912.		H. H. Counselman, Sec'y.
Massachusetts Vet. Ass'n			J. H. Seale, Salem.
Michigan State V. M. Ass'n			Judson Black, Richmond.
Minnesota State V. M. Ass'n			G. Ed. Leech, Winona.
Mississippi State V. M. Ass'n			J. C. Robert, Agricultural Col.
Missouri Valley V. Ass'n			
Missouri Vet. Med. Ass'n		Kansas City	Hal. C. Simpson, Denison, Ia.
Montana State V. M. A.	Jan. 29-30, 1912.	Bozeman	D. L. Luckey,
Nebraska V. M. Ass'n	January, 19 2.	Lincoln	A. D. Knowles, Livingston.
New York S. V. M. Soc'y	September, 1912.	Utica	W. H. Tuck, Weeping Water.
North Carolina V. M. Ass'n	June 1912	Raleigh	H. J. Milks, Ithaca, N. Y.
North Dakota V. M. Ass'n	Jan. 1912.	Agricul. Col.	M. J. Ragland, Salisbury.
North-Western Ohio V. M. A.	Feb and Nov.	Lima	C. H. Babcock, New Rockford.
Ohio State V. M. Ass'n	Jan. 16-17, 1912.	Columbus	A. J. Kline, Wauseon.
Ohio Soc. of Comparative Med.	Annually	Up'r Sandusky	O. V. Brumley, Columbus.
Ohio Valley Vet. Med. Ass'n		Okla. City	F. F. Sheets, Van Wert, Ohio.
Oklahoma V. M. Ass'n	Dec. 14-15, 1911.	Toronto	J. C. Howard, Sullivan.
Ontario Vet. Ass'n	April, 1912.	Philadelphia	C. E. Steel, Oklahoma City.
Pennsylvania State V. M. A.	March, 1912.	Manila	C. H. Sweetapple, Toronto.
Philippine V. M. A.	Call of President	Portland, Ore.	John Reichel, Glenolden.
Portland Vet. Med. Ass'n	4th Tues. ea. mo.	Mon. and Que.	David C. Kretzer, Manila.
Province of Quebec V. M. A.		Providence	Sam. B. Foster, Portland, Ore.
Rhode Island V. M. Ass'n	Jan. and June.		Gustave Boyer, Rigaud, P. Q.
South Carolina Ass'n of Veterinarians			J. S. Pollard, Providence
So. Illinois V. M. and Surg. A.	Jan. 2-3, 1912.	Centralia	Clarence E. Smith, Greenville
St. Louis Soc. of Vet. Inspectors	1st Wed. fol. the		F. Hockman, Louisville.
Schuylkill Valley V. M. A.	ad Sun. ea. mo.	St. Louis	Wm. T. Conway, St. Louis, Mo.
Soc. Vet. Alumni Univ. Penn.	Dec. 20, 1911.	Reading	W. G. Huyett, Wernersville.
South Dakota V. M. A.	2d Tues. July '12	Philadelphia	B. T. Woodward, Wash'n, D.C.
Southern Auxiliary of California		Aberdeen	S. W. Allen, Watertown.
State V. M. Ass'n			
So. St. Joseph Ass'n of Vet. Insp.	Jan. Apl. Jy. Oct.	Los Angeles	J. A. Dell, Los Angeles.
Tennessee Vet. Med. Ass'n	4th Tues. ea. mo.	407 Ill. Ave.	H. R. Collins, So. St. Joseph.
Texas V. M. Ass'n			A. C. Topmiller, Murfreesboro.
Twin City V. M. Ass'n	Call Exec. Com.	St. P. Minneap	R. P. Marsteller, College Sta.
Utah Vet. Med. Ass'n	2d Thu. ea. mo.	Logan	S. H. Ward, St. Paul, Minn.
Vermont Vet. Med. Ass'n	Mar. 1912		A. J. Webb, Layton.
Veterinary Ass'n of Alberta			G. T. Stevenson, Burlington.
Vet. Ass'n Dist. of Columbia	3d Wed. ea. mo.		C. H. H. Sweetapple, For.
Vet. Ass'n of Manitoba		514—9th St.,	Saskatchewan, Alta., Can.
Vet. Med. Ass'n of N. J.		N. W.	M. Page Smith, Wash., D.C.
V. M. Ass'n, New York City	Not stated	Winnipeg	F. Torrance, Winnipeg.
Veterinary Practitioners' Club			W. Herbert Lowe, Paterson.
Virginia State V. M. Ass'n	1st Wed. ea. mo.	141 W. 54th St.	R. S. MacKellar, N. Y. City.
Washington State Col. V. M. A.	Monthly	Jersey City	A. F. Mount, Jersey City.
Washington State V. M. A.		Pullman	W. G. Chrisman, Raleigh.
Western Penn. V. M. Ass'n	1st & 3d Fri. Eve.	Seattle	R. J. Donohue, Pullman.
Wisconsin Soc. Vet. Grad	3d Thurs. ea. mo.	Pittsburgh	J. T. Seely, Seattle.
York Co. (Pa.) V. M. A.	1st Tue. Mar. '12	York	Benjamin Gunner, Sewickley.
			J. P. West, Madison.
			E. S. Bausticker, York, Pa.

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Subscription price, \$3 per annum, invariably in advance; Canadian subscriptions, \$3.25; foreign countries, \$3.50; students while attending college, \$2; Students in Canada, \$2.25; single copies, 25 cents.

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ON page 27 (adv. dept.) of this issue of the REVIEW, will be found an illustration and description of the cheapest, the best, most practicable and most durable cautery that has yet been offered to the veterinary profession. Every veterinarian should have one, and *can* have one, as the price is right. Mention the REVIEW in writing; its editor uses one.

FOR those who desire to accomplish more work in less time, and save themselves physical exertion, we would suggest a perusal of page 12 (adv. dept.) of this issue of the REVIEW. The patentee is a practicing veterinarian and will be pleased to furnish practical information in regard to the instrument on application.